Supreme Court, U. S.
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IN THE
Supreme Court of the United States
OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, et al.,
Appellants,
v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

JURISDICTIONAL STATEMENT

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General

Attorneys for Appellants

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

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JURISDICTIONAL STATEMENT

Raymond Kassel, et al., appeal from the final judgment of the United States Court of Appeals for the Eighth Circuit, dated December 7, 1979, holding that Section 321.457(6), Iowa Code, creates an undue burden on interstate commerce in violation of Art. I, § 8 of the Constitution of the United States.

OPINIONS BELOW

The opinion of the United States Court of Appeals for the Eighth Circuit, which appears in the appendix hereto, p. 1a, *infra*, is not yet reported.

The opinion of the United States District Court for the Southern District of Iowa, which appears in the appendix hereto, p. 15a, *infra,* is reported at 475 F. Supp. 544 (S.D. Iowa 1979).

JURISDICTION

The judgment of the United States Court of Appeals for the Eighth Circuit, holding that Section 321.457(6), Iowa Code, creates an undue burden on interstate commerce in violation of Article I, Section 8, of the Constitution of the United States, was filed on December 7, 1979.

Notice of Appeal was filed January 4, 1980, and a supplementary Notice of Appeal was filed February 5, 1980. *See* p. 37a, *infra.*

This appeal is being docketed within 90 days from the entry of judgment below. The jurisdiction of this Court to review the decision by appeal is conferred by 28 U.S.C. § 1254(2) and is sustained by *Watson* v. *Employers Liability Assur. Corp.,* 348 U.S. 66 (1954), *rehearing denied,* 348 U.S. 921 (1955).

CONSTITUTIONAL PROVISION AND STATUTE

Article I, Section 8, United States Constitution:

The Congress shall have power . . . to regulate commerce with foreign nations, and among the several States, and with the Indian tribes. . . . Section 321.457, Iowa Code (1979):

> 321.457 *Maximum length.* The maximum length of any motor vehicle or combination of vehicles, except fire fighting apparatus and vehicles operated in the daytime when transporting poles, pipe, machinery or other objects of a structural nature which cannot be dismembered readily when required for emergency

repair of public service facilities or properties, and such vehicles transporting such objects operated at nighttime by a public utility when required for emergency repair of public service facilities or properties but in respect to such night transportation every such vehicle and the load thereon shall be equipped with a sufficient number of clearance lamps on both sides and marker lamps upon the extreme ends of any projecting load to mark clearly the dimensions of such load, at which time, a member of the state highway patrol shall be notified prior to the operation of such vehicle, shall be as follows:

1. No single truck, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

2. No single bus, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

3. Except as to combinations of vehicles, provisions for which are otherwise made in this chapter, no combination of truck tractor and a semitrailer hauling livestock shall have an overall length, inclusive of front and rear bumpers, in excess of sixty feet, nor shall any other combination of vehicles coupled together, unladen or with load, have an overall length, inclusive of front and rear bumpers in excess of fifty-five feet. Combinations of vehicles consisting of a motor vehicle upon which a van box is fastened and which draws and bears a portion of the weight of a semitrailer purchased by an Iowa resident prior to April 16, 1974, may be operated on the highways of this state with a length exceeding fifty-five feet but not exceeding sixty feet, if a special overlength permit is obtained from the department for such operation. This special overlength permit shall be issued for the vehicle and such permit shall be valid until such time as the vehicle is no longer operable or until the owner of the vehicle

transfers title to the vehicle to a nonresident. All such vehicles purchased after April 16, 1974, shall not be allowed to operate on the highways of this state.

4. However, a mobile home not in excess of forty-eight feet in length may be drawn by any motor vehicle, except a motor truck, provided, however, that the mobile home and its towing unit shall not be in excess of an overall length of sixty feet. For the purposes of this subsection, a light delivery truck, panel delivery truck or 'pickup' shall not be construed to be a motor truck. Further providing that a portable livestock loading chute not in excess of a length of thirteen feet including its hitch or tongue may be drawn by any vehicle or combination of vehicles, provided that such vehicle or combination of vehicles drawing such loading chute is not in excess of the legal length provided for such vehicles or combinations.

5. No combination of vehicles coupled together which are used exclusively for the transportation of passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, travel trailers, boats, farm and industrial tractors and self-propelled farm implements, nonself-propelled implements of husbandry, and self-propelled vehicles shall have an unladen length, inclusive of front and rear bumpers in excess of sixty feet, but the passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, or boats being transported may extend up to three feet beyond the front and rear bumpers of the transporting vehicles when the overall length of the vehicle with load does not exceed sixty-five feet.

6. No combination of three vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers in excess of sixty feet.

7. A motor vehicle or combination of vehicles may be operated upon the highways of this state, irre-

> spective of the length and weight limitations imposed by the laws of this state, if the motor vehicle or combination of vehicles is operated within the corporate limits of a city abutting a border of this state and such operations have been approved by ordinance of the city council and if the length and weight of the motor vehicle or combination of vehicles is in conformity with the laws relating to length and weight of the abutting state on July 1, 1974. If a city council has authorized such operation upon highways within the corporate limits, then the limit of travel for such motor vehicles or combination of vehicles within the state is extended to the commercial zones as described by federal regulations concerning interstate commerce, 49 code of federal regulations, paragraphs 1048.10, 1048.38, and 1048.101 as they exist on July 1, 1974.

QUESTIONS PRESENTED

1. Whether, when a state statute limiting the length of vehicles which may operate on its highways is challenged under the dormant commerce clause, a district court's review of conflicting evidence of legislative facts should be limited to the question of whether evidence has been presented sufficient to support a finding that a rational legislature could conclude that the length of vehicles is related to highway safety.

2. Whether, when conflicting evidence is presented on legislative fact questions concerning the nature and extent of the relationship between the length of vehicles and highway safety, the presumption of constitutionality requires a federal district court to defer to the legislative judgment and to treat the challenged regulation as a safety statute for purposes of weighing state interests against alleged burdens on interstate commerce.

3. Whether, when a district court makes findings of fact adverse to the asserted justifications for a state

statute challenged under the dormant commerce clause, the deference due state legislative judgments requires de novo review by appellate courts of those factual findings rather than application of the clearly erroneous standard of Rule 52, F.R.C.P.

4. Whether on this record it may be concluded that the Iowa regulation is irrational in permitting double-bottom trucks only five feet of additional length beyond that permitted conventional semi-trailers.

5. Whether, in the absence of Congressional action, recent increases in vehicle lengths permitted by some neighboring states and voluntary business decisions by some trucking firms may effectively preempt Iowa's long-standing judgment concerning the length of vehicles which may operate within its borders.

6. Whether the size of vehicles permitted to operate on a state's highways is a subject requiring uniform national standards such that the dormant commerce clause absolutely precludes all state regulation of vehicle size.

STATEMENT OF THE CASE

This is an appeal from a decision by the United States Court of Appeals for the Eighth Circuit affirming an order by the district court that required the State of Iowa to allow 65-foot, double-bottom trucks on its interstate highways.

The plaintiff below, Consolidated Freightways Corporation (hereinafter "CF"), is a regular route common carrier of general commodities operating in forty-eight states under a Certificate of Public Necessity issued by the Interstate Commerce Commission. Defendants below are individual officers of the State of Iowa (hereinafter

"Iowa"), responsible in varying degrees for the enforcement of Iowa's motor vehicle laws.[1]

The statutes challenged by CF represent the Iowa legislature's longstanding judgment concerning the permissible length of trucks of various configurations. Iowa restricts most truck-tractor, semi-trailer combinations to 55 feet. Combinations of three or more vehicles (double-bottoms) and semi-trailers hauling livestock, mobile homes, or transporting other highway or farm vehicles and implements, are permitted a maximum length of sixty feet. Section 321.457, Code of Iowa (1979). Equipment carried on vehicle or implement carriers is permitted to extend three feet beyond the front or rear bumpers, provided the overall length of the load does not exceed 65 feet, § 321.457(5). None of the defendants currently possesses discretionary authority to permit exceptions to these limitations for divisible loads.

The proceedings below developed an extensive record consisting of some 52 evidentiary depositions, 14 days (2,000 pages) of trial testimony, and several hundred exhibits. At trial, Iowa justified the length limitations in question by reference to the state's interests in maximizing highway safety and minimizing the cost of highway maintenance. The record reflects that all states regulate the length of vehicles which may operate on their highways as a means of promoting safety. Iowa introduced evidence tending to show that longer vehicles require more time to pass, thereby increasing the risk of accident (particularly in inclement weather), that additional length contributes to intersection congestion, and that longer vehicles pose greater hazards at the scene of an accident. State officials also expressed concern that possible increased traffic from permitting longer vehicles would cause further deterioration of Iowa's already tired roads, thereby increasing safety hazards attributable to traffic congestion, road deterioration and obstructions incident to highway restoration projects.

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[1] Motor Club of Iowa, a not-for-profit group organized to advance the interests of the motoring public, was permitted to intervene below as a party defendant, but has not appealed from the order of the district court.

In rebuttal of CF's claim that 65-foot double-bottoms (hereinafter "doubles"), because of their configuration, are safer than the vehicles permitted on Iowa roads, Iowa introduced evidence tending to show that doubles have no demonstrable safety advantages over conventional semi-trailers (hereinafter "semis"). For example, Iowa introduced evidence from CF's own records that doubles jacknife and upset more than semis in snow and ice, being generally less stable, that CF's overall accident rate for doubles in 1975, 1976, and 1977 (but not 1978) exceeded that of semis, and that some of CF's own drivers expressed a preference for semis over doubles in bad weather. In addition, the statistical expert for Iowa refuted the validity of various statistical studies offered by CF (including the Bureau of Motor Carrier Safety Study relied upon so heavily by the carriers in *Raymond Motor Trans. Inc.* v. *Rice*) because of inadequate sample size or failure to control for significant variables. Indeed, the inadequacy of available statistical studies is dramatically underscored by the fact the Federal Highway Administration is in the midst of Project No. 1-U, a massive effort to determine the relative safety aspects of increased vehicle size and weights and their effect on other highway users. This study will not be completed until 1982 at the earliest.

The district court found as a fact that given CF's recent voluntary business decision to purchase 65-foot equipment, and given the recent legislative decisions of many midwestern states to permit 65-foot equipment, Iowa's longstanding 60-foot limitation "caused" a burden on interstate commerce, namely, CF's diversion of its equipment around Iowa and into states in which it could be lawfully operated.

Although it recognized the effort made by Iowa to reinforce the "strong presumption of the validity" of the statutory limitation as a safety measure (App., *infra* p. 20a), the district court found as an adjudicative fact that "there is no valid safety reason for barring twins from Iowa's highways *because of their configuration.*" The district court further stated that "[t]he evidence convincingly, if not overwhelmingly, establishes that the 65-foot twin is as safe as, if not safer than, the 60-foot twin and the 55-foot semi." (App., *infra* at p. 21a). In balancing Iowa's interests in length limitations against the burdens on interstate commerce, the district court stressed the proposition that interstate highways are not a local concern. At the same time, the district court explicitly rejected CF's claim that Iowa's length limitations discriminated against interstate commerce. The court found the regulations neutral on their face and that CF had not proven any discriminatory enforcement. All but one of the statutory exceptions were found to be consistent with the state's concern for safety. (App., *infra* at pp. 29a-30a). Finally, the district court called for action by Congress:

> The trucking industry has long played leapfrog with weight and length limitations to achieve alternate increases. Truckers that haul products that "cube out" before they "weigh out" ask for an increase in length of a few feet so they can take advantage of the weight limit. Then those truckers that haul products that "weigh out" before they "cube out" ask for weight increases so they can utilize the additional length. It is not difficult to establish that the small increase in weight or length creates no additional safety hazard damage to highways. With some officials saying 108 foot triple-bottoms impose no additional safety hazard on interstates, there appears to be no end in sight.

> If this concern points to anything of particular significance, it is that the interstates should be treated differently than other highways. Regulations regarding the length. width and weight of vehicles using the interstate system should be uniform. Congress should pre-empt this area of the law and set these standards.

(App., *infra* at pp. 27a-28a)

The Eighth Circuit Court affirmed, holding that the Dormant Commerce Clause requires Iowa to permit CF to operate doubles 10 feet longer than the limit for semis; a mere five additional feet were held constitutionally insufficient. Reading *Raymond Motor Trans. Inc.* v. *Rice,* 343 U.S. 423 (1978) (hereinafter "*Raymond*"), to require a Federal District Court to determine whether safety justifications are substantive as a matter of adjudicative fact (App., *infra* at p. 7a), the Court of Appeals concluded that the District Court's Findings of Fact were not "clearly erroneous." (App., *infra* at p. 7a). In contrast to the Findings and Conclusions of the District Court, the Court of Appeals held that the cumulative effect of various exemptions from Iowa's length regulations constituted a "factor weakening the presumption in favor of a safety regulation" and reduced "our willingness to assume that the State's own political process serves as a check on burdensome regulations." (App., *infra* at pp. 10a-11a). Judge Henley, writing *Dubitante,* noted that the Court of Appeals' reading of *Raymond* was difficult to reconcile with the rule of *Brotherhood of Locomotive Firemen & Enginemen* v. *Chicago, R.I. & P.R. Co.,* 393 U.S. 129, 138-39 (1968), that "the District Court's responsibility for making 'findings of fact' certainly does not authorize it to resolve conflicts in the evidence against the legislature's conclusion or even to reject the legislative judgment on the basis that . . . the legislative viewpoint constitutes nothing more than . . . 'pure speculation.'" (App., *infra* at p. 12a).

THE QUESTIONS ARE SUBSTANTIAL

Whether Iowa must permit 65-foot doubles to operate on its highways is an important question; it is not, standing alone, a question upon which rests the fate of the Republic. If the decision of the courts below is left standing, however, states may no longer regulate the length of trucks on their highways. Given Congressional inaction on the subject, this preclusive interpretation constitutes a major reallocation of authority in our federal system.

Challenges to state safety regulations under the dormant commerce clause frequently present analytic difficulty. Nonetheless, certain general principles of adjudication have emerged from prior decisions of this Court which suggest the following analytical framework. Congress possesses exclusive authority to regulate interstate commerce, qua interstate commerce, and the states may not erect barriers to the free flow of interstate commerce. However, in the absence of congressional regulation, states may adopt nondiscriminatory regulations of local activities within their borders to promote the health, safety and welfare of its citizens, even if such regulations have an incidental impact on interstate commerce. *Raymond*, 434 U.S. at 440. To insure that states do not attempt to impede interstate commerce under the guise of police power regulation, federal courts will not conclusively presume that the stated purpose of state regulation is necessarily its real motive. *Hunt* v. *Washington State Apple Advertising Comm'n*, 432 U.S. 333, 352 (1977). Once it is determined as a threshold matter that the purpose and effect of the state regulation relate to legitimate state interests, it may still be necessary for a federal court to balance competing interests to determine whether "the burden imposed on such commerce is clearly excessive in relation to putative local benefits." *Huron Cement Co.* v. *Detroit*, 362 U.S. 440, 443 (1960). However, where a court is satisfied that a regulation advances a state interest in highway safety, the balancing process begins with a strong presumption of validity for that regulation and legislative judgments about the relative importance of safety benefits in comparison with related burdens on interstate commerce will not be second-guessed by federal courts. *Raymond*, 434 U.S. at 443-44, 449-50; *Bibb* v. *Navajo Freight Lines*, 359 U.S. 520, 524 (1959); *South Carolina Highway Dept.* v. *Barnwell Bros. Inc.*, 303 U.S. 177, 190-91 (1938); *Sproles* v. *Binford*, 286 U.S. 374, 388-89 (1932).

Guided by these accepted principles, the courts below should have addressed three principal questions in resolving the issues tendered to them: 1) Can § 321.457, taken as a whole, fairly be characterized as a highway safety measure? 2) Is there a rational basis for the particular length limitations imposed upon various classes of vehicles? 3) Assuming that it is a rational safety measure, does § 321.457 impose burdens on interstate commerce that clearly outweigh the safety benefits?

If this mode of analysis is employed, the constitutionality of § 321.457 must be upheld. First, the question of whether the statute may fairly be characterized as a safety measure reduces to the question of whether considerations of vehicle length are rationally related to their safety. That is a question of fact, but it is a question of *legislative* fact, *i.e.*, a general proposition of social fact that underlies a legal premise. *See* K. Davis, *Administrative Law Treatise*, § 12:03 (2d ed. 1979). In previous decisions, this Court has been prepared to take judicial notice, as a legislative fact, of the relationship between safety and truck size. *See Morris* v. *Duby*, 274 U.S. 135, (1927). *See generally* Advisory Committee's Note, Rule

201, Federal Rules of Evidence (West. 1979). And, all states regulate the length of vehicles which may operate upon their highways as a means of promoting safety. Although CF did not directly dispute the general relationship between truck length and safety, there is evidence in the record both supporting and discounting the extent of that relationship. What emerges with stark clarity from the record, however, is that experts cannot make precise statistical statements about the relationship. In any event, the district court plainly found that length is generally related to safety. In decrying the leapfrog tactics of the trucking industry and calling for Congressional specification of uniform length standards, the district court recognized a legitimate safety concern with the ever longer vehicles the industry prefers to operate. On this record, the trial court could not, and did not, conclude that length is unrelated to safety as a matter of law. *Cf. Raymond,* 434 U.S. at 450 (concurring opinion).

If length is related to safety, the next question is whether the particular length limitations imposed by § 321.457 are rational. Although this may more properly be a due process than a commerce clause inquiry, the question has been addressed in this case. The problem here is essentially one of legislative line-drawing, not unlike the problem of setting a minimum voting age. Maturity is thought to be related to casting a minimally intelligent ballot, but whether the voting age should be set at 16, 18 or 21 is a question about which reasonable people may differ.

In the absence of a suspect classification or adverse impact upon a fundamental right, federal courts employ a deferential "rational basis" standard of review to questions of legislative line-drawing. *Railway Express Agency* v. *New York,* 336 U.S. 106 (1949). There has been no showing here that Iowa has been constitutionally unreasonable in drawing the line in the general range of 55 to 60 feet. Nor has there been a showing that Iowa has unconstitutionally disadvantaged doubles vis-a-vis semis. Indeed, apparently because of their configuration, Iowa permits doubles to operate five feet longer than semis. It cannot seriously be argued that it is irrational to decline to provide an additional five-foot differential to doubles because of their configuration.

The final question is whether, given the presumption of constitutionality, the burdens on interstate commerce are plainly excessive in relation to the safety benefits. This question was not properly addressed below because § 321.457 was not treated by the courts as a safety measure.

The courts below, however, did not adopt this traditional mode of analysis because they misinterpreted this court's decision in *Raymond Motor Trans. Inc.* v. *Rice, supra.* Rather, CF tendered and the courts adopted the question of whether 65-foot doubles are less safe than 55-foot semis because of their configuration. Plainly, however, Iowa prohibits 65-foot doubles because of their 65-foot length, not because of their twin-trailer configuration. Moreover, the courts below treated the question as one of adjudicative fact appropriate for traditional "findings of fact" and the application of a "clearly erroneous" mode of appellate review. If that were the appropriate question, it must be conceded that experts cannot provide statistically reliable evidence that 65-foot doubles are less safe than 55-foot semis. The record here makes clear that the state of the art has not advanced to the point where reliable statistical statements can be made when the inquiry is focussed that narrowly. Indeed, Iowa could not provide reliable expert testimony that 55-foot semis are less safe than 65-foot doubles and thus that limitation would also now be suspect. For that matter, because there has been so little experience with

100-foot triples, it is doubtful that experts could make reliable statements clearly showing that 100-foot trucks are less safe than 60-foot trucks. There are many good reasons to believe they are less safe, but scientific proof is another matter. For these reasons, if the decision below remains intact the states are totally removed from the regulation of vehicle length, even if Congress continues to refrain from preempting the field.

The courts below reached this disturbing result because they asked the wrong question; and they asked the wrong question because they misread *Raymond.* Properly interpreted, *Raymond* represents an application of the accepted doctrine that a federal court need not always accept a safety justification for a state regulation on the naked assertion of the state's lawyers. In this regard, *Raymond* stressed 1) the extensive evidentiary showing of the trucking firms concerning the safety of the trucks they wished to operate; 2) the complete lack of evidence offered by Wisconsin in support of the general relationship between length and safety; and 3) the numerous discretionary exceptions to the Wisconsin length limitation, which had been applied in a manner that demonstrated greater concern for protecting domestic commerce than for promoting highway safety. Largely ignored by the courts below were this Court's careful statements limiting *Raymond* to its facts and emphasizing that a state need only make a colorable showing that its regulations contribute to highway safety. *Raymond,* 434 U.S. at 448.

The record in this case distinguished the Iowa length limitations in all of these vital respects. Iowa offered voluminous evidence rebutting the claims of CF and made a substantial showing that length is related to safety.[2] And, although the Court of Appeals attempted, sua sponte, to bring this case within the narrow *Raymond* holding by characterizing certain variations in the length limitations as "protectionist," that characterization will not bear analysis, comparison with the district court's findings and conclusions, nor a fair review of the evidence presented.

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[2] This evidence cannot be cavalierly rejected by the suggestion that safety concerns are less serious with respect to the operation of longer vehicles on limited access, four-lane highways. While it

Because of a misreading of *Raymond*, the courts below not only asked the wrong question but also adopted the wrong analytical framework for addressing the question. In *Raymond*, Wisconsin urged that their regulation should prevail if, without more, it bore a rational relation to highway safety. This Court rejected that claim, properly holding that even were a rational relationship shown, it would still be necessary for a federal court to address a further question, namely whether the burden on commerce clearly outweighs putative safety benefits. The latter question plainly compels a balancing of competing interests.

The courts below mistook this rejection of Wisconsin's ultimate claim as an invitation to federal courts to sit as highway safety examiners and to make de novo determinations, using preponderance of evidence and clearly erroneous standards of review, of whether a highway regulation advances safety. But *Raymond* did not reject the presumption of constitutionality. Nor did it reject the teaching of *Brotherhood* that, in the guise of finding facts, a federal court should not resolve conflicting evi-

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may be proper to limit the relief granted to that requested, the courts below were evaluating the underlying basis of Iowa's comprehensive length regulation. In Wisconsin, by way of contrast, the Department of Transportation possessed administrative discretion to permit doubles solely on interstate highways. The issue in *Raymond* was thus the reasonableness of the refusal to make one additional administrative exception in a context where exceptions were virtually the rule. In any case, the analysis employed by the courts below clearly jeopardizes the continuing validity of length limitations on all Iowa highways carrying significant interstate commerce.

dence in an area of scientific uncertainty to reject a reasonable policy judgment by a legislative body.

Unlike Wisconsin, Iowa made a sufficient showing that length is related to safety and that it is rational to permit doubles only five feet more length than semis. Thus, the third stage of the analysis, the balancing of local interests against the burden on interstate commerce, should have been approached from quite a different perspective than in *Raymond.* Here, unlike in *Raymond,* the balancing should have commenced with the considerable weight traditionally attached to a reasonables legislative concern for highway safety.

If the balancing question is approached from that perspective, the Iowa regulation must be upheld on this record. First, the court below inappropriately treated the Iowa regulation as the *cause* of the claimed burden. But the record clearly shows that Iowa's length limitations are of long standing and that the diversion around Iowa stems from CF's voluntary decision to purchase longer equipment which may now be lawfully operated in surrounding states as a result of legislative changes. Accepting a causal argument of that type effectively permits the trucking industry and a few other states to preempt a reasonable state policy. Heretofore only Congress has been conceded that authority. *Sproles* v. *Binford,* 286 U.S. 374, 390 (1932) and *South Carolina State Highway Dept.* v. *Barnwell Bros.,* 303 U.S. 177, 195-96 (1938), expressly reject the notion that one state can preempt another in an area admitting of diversity of regulation. *Raymond* certainly did not purport to change the traditional view that highway regulation is a matter of local concern which does not, in the absence of Congressional action, require a uniform policy of laissez-faire.

Even were it appropriate to attribute the claimed burden to Iowa's length regulation, the nature and the extent of CF's showing does not outweigh the safety and other state interests supporting the length limitation. CF made no showing that the flow of real goods is actually impeded; the length limitation does not operate as a barrier to the underlying commerce. Moreover, unlike in *Raymond*, Iowa challenged CF's efforts to establish a quantifiable burden on interstate commerce. At best, CF showed that diverting their equipment produced a modest increase in their costs, a one time increase in costs equivalent to less than one-third of one percent of CF's operating costs for a particular year. In contrast, CF experienced a 24 percent, per year increase in fuel costs in the years 1972 through 1977, cost increases not attributable to Iowa's length statute. Moreover, CF admitted that its profitability has increased, as have its Iowa operations. Finally, CF made no showing that any lowered costs attributable to operating 65-foot doubles in Iowa would be translated into lower rates for shippers. In short, the legitimate concerns for a free and efficient national market, which properly underlie the rare invalidation of state regulations by federal courts under the dormant commerce clause, are not present here. *See generally*, Tushnet, *Reexamining the Dormant Commerce Clause*, 1979 Wis.L.Rev. 125.

Raymond did not purport to overrule *Barnwell;* it did not purport to overrule *Brotherhood.* Nor did it suggest that the states are to be absolutely precluded from imposing rational, nondiscriminatory length limitations on vehicles operating on state highways. If the decision below is affirmed, however, it will be plain to all perceptive lawyers that *Raymond* has acquired precisely those effects.

CONCLUSION

For these reasons, this Court should note probable jurisdiction of this appeal.

Respectfully submitted,

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General

Attorneys for Appellants

February , 1980

APPENDIX

APPENDIX

UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

No. 79-1709

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, a Delaware Corporation,
Appellee,

v.

RAYMOND KASSEL, Individually and in his capacity as Director of Transportation; ROBERT RIGLER, Individually and in his capacity as a member and Chairman of the Transportation Commission; L. STANLEY SCHOELERMAN, Individually and in his capacity as a member of the Transportation Commission; DONALD GARDNER, Individually and in his capacity as a member of the Transportation Commission; JULES BUSKER, Individually and in his capacity as a member of the Transportation Commission; ALLAN THOMS, Individually and in his capacity as a member of the Transportation Commission; BARBARA DUNN, Individually and in her capacity as a member of the Transportation Commission; WILLIAM MCGRATH, Individually and in his capacity as a member of the Transportation Commission; JON MCCOY, Individually and in his capacity as Director of the Motor Vehicle Division; CHARLES W. LARSON, Individually and in his capacity as Commissioner of the Department of Safety; EDWARD DICKINSON, Individually and in his capacity as Chief of the Iowa Highway Patrol; RICHARD C. TURNER, Individually and in his capacity as Attorney General; and ROBERT D. RAY, Individually and in his capacity as Governor,

Appellants,

MOTOR CLUB OF IOWA,
Intervenor-Appellant.

Appeal from the United States District Court
for the Southern District of Iowa

Submitted: October 11, 1979
Filed: December 7, 1979

Before LAY, HEANEY and HENLEY, Circuit Judges.

HEANEY, Circuit Judge.

The sole issue on appeal is whether the trial court[1] erred in holding that an Iowa law barring the use of trucks longer than sixty feet on Iowa's interstate highways unconstitutionally burdened interstate commerce. Since we find that this case cannot be meaningfully distinguished from *Raymond Motor Transportation, Inc.* v. *Rice*, 434 U.S. 429 (1978), we affirm.

Consolidated Freightways Corporation of Delaware is a regular route common carrier of general commodities operating in forty-eight states under a Certificate of Public Convenience and Necessity issued by the Interstate Commerce Commission. Its business consists primarily of consolidating and transferring small shipments from one location to another by truck. To move these goods, Consolidated operates a variety of tractor-trailer combinations of which the sixty-five-foot combination of a tractor and two trailers (sixty-five-foot twins) has become the most common.

Iowa law[2] prohibits the use of sixty-five-foot twins on its highways although it allows sixty-foot twins and fifty-five-foot semis (a combination of a tractor and a forty-five-foot trailer).[3] The sixty-foot twins are not an industry standard and are used primarily in states that prohibit the longer trailers.

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[1] United States District Court for the Southern District of Iowa, Central Division.

[2] The specific law in question, Iowa Code § 321.457(6), reads as follows:

> 6. No combination of three (3) vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers in excess of sixty feet.

Two major interstate highways, I-80 and I-35, cross Iowa. I-80 is a principal east-west transcontinental route and is heavily used in the shipment of goods between the two coasts. Sixty-five-foot twins are permitted on the entire length of I-80 except in the states of Pennsylvania, New Jersey and Iowa. I-35 is a principal north-south route linking Minnesota to Texas. Sixty-five-foot twins are lawful on the entire length of I-35 except in Iowa. As a result of Iowa's prohibition on sixty-five-foot twins, Consolidated (1) diverts its sixty-five-foot twins off of the interstate system and on to longer routes around the state, (2) shuttles its twin trailers across the state individually, and (3) uses sixty-foot twins and fifty-five-foot semis in the state.

Consolidated brought this action claiming that the prohibition on the use of sixty-five-foot twins on Iowa's interstate highways is an unconstitutional burden on interstate commerce. It also alleges that statutory and administrative exceptions to Iowa's general limitation discriminate against interstate commerce in favor of local interests. It sought, and the district court granted, injunctive relief preventing the enforcement of Iowa's law as applied to sixty-five-foot twins on Iowa's interstate highways.[4] The court also enjoined enforcement of the

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[3] Illustrations of the sixty-five-foot twins and the fifty-five-foot semis can be seen at 417 F.Supp. 1352, 1363 (*Raymond Motor Transportation, Inc.* v. *Rice*, (W.D. Wis. 1976)).

[4] In addition to I-80 and I-35, the district court enjoined enforcement on Interstate Highways 280, 380, 29, 680 and 235. I-280 is an alternative routing of I-80 in the Moline-Rock Island-Davenport metropolitan area. I-380 connects Cedar Rapids, Iowa, with I-80. I-29 is a north-south route connecting Kansas City, Missouri, with Canada. I-680 is an alternate routing of I-80 and I-29 in the Council Bluffs area. I-235 is an alternate routing of I-80 and I-35 in the Des Moines, Iowa, area.

Iowa law on roads furnishing reasonable access between the interstates and Consolidated's terminals and facilities for food, fuel, repairs or rest. This appeal followed.

I.

In granting relief, the district court relied on *Raymond Motor Transportation, Inc.* v. *Rice, supra.* In *Raymond,* Consolidated and another common carrier challenged Wisconsin's general prohibition on trucks longer than fifty-five feet. The case was tried to a three-judge district court on affidavits, depositions and exhibits. That court upheld the law as a valid state safety regulation. In reversing, the Supreme Court noted that the trucking interests had "produced uncontradicted evidence showing that their operations are disrupted, their costs are raised, and their service is slowed by the challenged regulations." *Id.* at 438. These disruptions and added expenses included shuttling twin trailers in and out of the state, diverting its long east-west routes around the state, and using fifty-five-foot semis rather than sixty-five-foot twins on Wisconsin routes between Chicago and Minneapolis. *Id.* The Court also noted that the truckers had "presented a great deal of evidence supporting their allegations that 65-foot doubles are as safe as, if not safer than, 55-foot singles when operated on limited-access, four-lane divided highways." 434 U.S. at 436. Wisconsin, "for reasons unexplained, made no effort to contradict this evidence of comparative safety with evidence of its own." *Id.* at 437.

On the basis of this record, the Supreme Court concluded that the strong presumption of validity generally attaching to state highway safety regulations was rebutted. The Court stated:

> On this record, we are persuaded that the challenged regulations violate the Commerce Clause because they place a substantial burden on interstate commerce and they cannot be said to make more

> than the most speculative contribution to highway safety. Our holding is a narrow one, for we do not decide whether laws of other States restricting the operation of trucks over 55 feet long, or of double-trailer trucks, would be upheld if the evidence produced on the safety issue were not so overwhelmingly onesided as in this case.

Id. at 447 (footnote deleted).

The similarities between the instant case and *Raymond* are manifest. The primary difference, however, is that Iowa, unlike Wisconsin, zealously presented arguments concerning two major issues in the case: the interference with interstate commerce and the safety advantages of its regulation. Additionally, it augmented the customary safety argument—that sixty-five-foot twins were in some respects less safe than other truck configurations—by attempting to show that the regulation promoted safety by reducing the amount of traffic crossing the state. Despite these efforts, the district court concluded that (1) the state law interferred with interstate commerce, (2) "[t]he evidence convincingly, if not overwhelming, establishes that the 65 foot twin is as safe as, if not safer than, the 60 foot twin and the 55 foot semi," slip op. at 6, and (3) even given the local benefits derived by diversion of traffic around the state, the "*total effect* of the law as a safety measure * * * is so slight and problematical that it does not outweigh the national interest." Slip op. at 11 (emphasis in original).

II.

Iowa presents two significant contentions on appeal. The first relates to the district court's analysis of the evidence regarding the safety features of the sixty-five-foot twin as compared with other truck configurations. The second concerns the district court's analysis of the argument that, by prohibiting traffic that might otherwise flow through the state, Iowa's law promotes legitimate local safety interests.

A.

Iowa first argues that the district court erred in substituting its judgment for that of the Iowa State Legislature in determining whether sixty-five-foot twins are safe enough for Iowa's interstate highways. Iowa contends that, instead of making a finding as to the relative safety of the sixty-five-foot twin and the sixty-foot twin or fifty-five-foot semi, the district court should have merely probed the factual dispute with an eye toward determining whether the state's safety justification was "arguable" or "colorable." [5] If any "colorable" or "arguable" safety justification exists, Iowa argues, *Raymond* requires that the regulation be presumed valid when weighed against its alleged burden on interstate commerce.

We cannot accept either Iowa's reading of *Raymond* or its characterization of the district court's treatment of the factual issue before it. First, in *Raymond*, the Supreme Court did not suggest that any state regulation supported by a "colorable" safety claim is to be cloaked with the presumption of validity ordinarily attaching to legitimate safety regulations. The Court held, rather, that when a burdensome regulation cannot, on the record, "be said to make more than the most speculative contribution to highway safety," *Raymond Motor Transportation, Inc.* v. *Rice*, *supra* at 447, it is unconstitutional. It did not authorize courts to substitute their judgments for those of the state legislatures, but directed them only to examine the evidence to see whether reputed safety justifications are substantive, not "illusory." *See id.* at 449 (Blackmun, J., concurring.)

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[5] Iowa apparently bases its test of arguability or colorability on the following sentence in *Raymond Motor Transportation, Inc.* v. *Rice*, 434 U.S. 429, 448 (1978): "The State of Wisconsin has failed to make even a colorable showing that its regulations contribute to highway safety."

Second, the district court did exactly what *Raymond* charged it to do; it examined the record to determine whether the reputed safety justification was substantive. It did not, as Iowa contends, usurp the function of the state legislature in balancing policies. Rather, it simply determined, on the record before it, that the asserted connection between the prohibition of the sixty-five-foot vehicle and a reasonable concern with its safety was illusory. It made a specific finding that "[t]he evidence convincingly, if not overwhelmingly, establishes that the 65 foot twin is as safe as, if not safer than, the 60 foot twin and the 55 foot semi." Slip op. at 6. Thus, there is no safety justification (based on the truck itself as distinguished from the traffic flow of which it is a part) for the prohibition of sixty-five-foot twins unless the district court's factual finding was clearly erroneous.

After our own review of the record, we cannot say that the district court's finding as to the safety of the sixty-five-foot twin was clearly erroneous. Significantly, even Iowa does not appear to contend that the district court's *overall assessment* of the safety of sixty-five-foot twins was erroneous. Rather, using the legal standard that we have here rejected, it contends that a "colorable" argument was made regarding the safety aspects of its regulation through evidence that various characteristics of the sixty-five-foot twin are less advantageous than the corresponding characteristics of the fifty-five-foot semi or the sixty-foot twin. The district court, however, specifically addressed the issue of differing characteristics as follows:

> Twins and semis have different characteristics. Twins are more maneuverable, are less sensitive to wind, and create less splash and spray. However, they are more likely than semis to jackknife or upset. They can be backed only for a short distance. The negative characteristics are not such that they render the twin less safe than semis overall. Semis

> are more stable but are more likely to "rear end" another vehicle.
>
> The added length of the twin is not a substantial factor on four lane divided highways. The state by legalizing the 65 foot automobile carrier has weakened its claim that the extra length creates a safety hazard. It has practically destroyed its argument that double trailers are an additional safety hazard by legalizing the 60 foot twin. The uncontradicted evidence established that the extra five feet in length makes the 65 foot twin more stable than the 60 foot twin.

Slip op. at 6.

The evidence concerning differing characteristics supports, rather than negates, the district court's finding that overall sixty-five-foot twins are as safe or safer than the trucks Iowa currently permits. That finding, based as it is on a record replete with substantiating evidence,[6] is not clearly erroneous. Not one expert, nor any reliable study, took direct issue with it.

B.

Iowa's second major contention is that the district court failed to give proper weight to the second prong of its safety argument. This argument, in essence, is that because the prohibition of sixty-five-foot twins reduces the traffic that might otherwise flow through Iowa, it reduces roadwear and the risk of accident to Iowa's citizens and is, therefore, a valid safety regulation. This argument recognizes the burden that Iowa law currently imposes on interstate commerce by diverting sixty-five-foot twin traffic off the interstate system, primarily on to a longer two-lane state highway in Missouri. If Iowa's law were changed, this traffic would follow the most geographically efficient route, which is I-80, through Iowa.[7]

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[6] The record includes the testimony of a host of experts, state and federal highway officials, insurance analysists and a variety of statistical studies. It also includes a report prepared by the Iowa Department of Transportation in April of 1975 entitled "Sixty-Five Foot Twin-Trailers on Iowa Highways: Perspective." A particularly significant conclusion of this report is that "65 foot twin trailer combinations have not been shown to be less safe than 60 foot twin trailer combinations or conventional tractor-semitrailers." Plaintiff's Exhibit 2 at 26. It also noted that sixty-five-foot twins have a better turning radius and a shorter stopping distance than do semis. In other characteristics, the report noted no difference between the two vehicles. *Id.*

In analyzing this safety justification for the Iowa law, the district court recognized both Iowa's safety interests and the significance of a countervailing safety interest in other states. Though Iowa's safety interest is obvious, the court noted, "it is equally clear that Iowa's length restriction causes the trucks affected by the ban to travel more miles over more dangerous roads in other states which means a greater overall exposure to accidents and fatalities." Slip op. at 8-9. "There is," the court continued, "a parochialism about [Iowa's] local approach to public health and safety, that gives it less weight in the balance between legitimate local concerns for the health and economic welfare of its citizens and the burden on interstate commerce. It has the aura of protectionism usually associated with discrimination against interstate commerce." *Id.* at 10. As a result, the court made the "delicate adjustment of the conflicting state and federal claims," *Raymond Motor Transportation, Inc.* v. *Rice, supra* at 440 (quoting *Great A&P Tea Co.* v. *Cottrell*, 424 U.S. 366, 371 (1976)), in favor of the national interest in unburdened interstate commerce.

With this adjustment we can only agree. When a state regulation directly pursues a valid safety objective, some burdening of interstate commerce will be tolerated. How much is a matter of balance. *See Raymond Motor Transportation, Inc.* v. *Rice, supra* at 441. When, however, the regulation's objective accrues not directly, by prohibiting a vehicle with which there is some inherent safety problem, but indirectly, by the deflection of interstate commerce away from the state, the balancing is automatic, national interests must prevail. We caution that our holding in no way endorses a "lowest common denominator approach" to state safety regulation; it does not compel states to sacrifice legitimate safety regulations in the face of lower standards in neighboring states. We hold only that when a state advances a regulation that both burdens interstate commerce and fails to directly protect a state safety interest, that regulation must succumb to the dominate national interest.

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[7] The 1975 report by the Iowa Department of Transportation cited in note 6 predicted that at that time, repeal would have increased Iowa highway usage by approximately 75,000 truck trips each year. *Id.* Current estimates are higher.

III.

One final reason for our affirmance concerns the cumulative effect of various exemptions from Iowa's general highway length and weight regulations. The district court considered Iowa's exceptions and concluded that they did not form an independent ground for invalidating the regulation. We note, however, that regardless of whether the challenged exceptions would themselves make out a case of unconstitutional discrimination, they may constitute a factor weakening the presumption in favor of a safety regulation. *Raymond Motor Transportation, Inc.* v. *Rice, supra* at 446. This would be so if it appears that the exceptions are "the product of compromise between forces within the State that seek to retain the State's general truck-length limit, and industries within the State that complain that the general limit is unduly burdensome." *Id.* at 447.

Iowa's exception to its general limitations include the following:

(1) Iowa Code § 321.457(7) gives Iowa's border cities the power to adopt by ordinance the length and width limitations of the abutting state. This exception, of course, works to mitigate the local hardships imposed by the general prohibition.

(2) Iowa Code § 321.457(5) allows for the transportation of passenger vehicles, light trucks, boats and farm tractors and implements in vehicles of sixty feet with an overhang not to exceed sixty-five feet. This exception not only eases the burden on the general limitation on Iowa consumers and its agricultural community, but it undercuts Iowa's argument that sixty-five-foot twins are unsafe due to their length.

(3) Iowa Code § 321.457(3) allows for the transportation of livestock in sixty-foot semis. Other semis are limited to fifty-five feet. This exception is of undoubted assistance to Iowa's agricultural interests.

(4) The record also discloses that the Governor of Iowa has the power to proclaim a state of emergency "to protect the public peace, health and safety, and to preserve the lives and property of the people of the state." Slip op. at 14. The Governor and his agents used this power to authorize the issuance of 1,636 permits in 1977 and 2,984 permits in 1978 providing temporary exemptions from general weight limitations.

Together, these exceptions appear to work a rough "compromise between forces within the State that seek to retain the State's general truck-length limit, and industries within the State that complain that the general limit is unduly burdensome." *Id.* at 447. Certainly, they reduce our willingness to assume that the state's own political process serves as a check on burdensome regulations. Consequently, we consider these exemptions as another factor reducing the weight of Iowa's safety claim in the balance with national interests.

For these reasons, we affirm.

HENLEY, Circuit Judge, *dubitante*.

Applying a test used by Mr. Justice Powell in *Raymond Motor Transportation, Inc.* v. *Rice*, 434 U.S. 429 (1978), our court affirms a finding of violation of the commerce clause. Given the manifest similarities between the instant case and *Raymond*, it may well be that affirmance is in order. Even so, it is at least questionable whether the Supreme Court requires a balancing of the burden on interstate commerce against putative local benefits. *Id.* at 441-42. This uncertainty stems from the fact that the Supreme Court may have enunciated three or more distinct tests for determining whether a state statute unconstitutionally burdens interstate commerce.

In *Brotherhood of Locomotive Firemen & Enginemen* v. *Chicago, R.I. & P. R. Co.*, 393 U.S. 129 (1968), the Court set out what may be called a "deferential" test to determine the legitimacy of a state statute burdening interstate commerce. In *Brotherhood*, a group of interstate railroads operating in Arkansas sought declaratory and injunctive relief claiming in part that Arkansas laws requiring a minimum train crew for certain conditions of railroad operation violated the commerce clause. The Supreme Court, in a seven-one decision, held that the district court erred in striking down the "full crew" laws as violative of the commerce clause because it had "indulged in a legislative judgment wholly beyond its limited authority to review state legislation under the commerce clause." *Id.* at 136. The Court noted that the question of safety is clearly one for legislative determination and "[t]he District Court's responsibility for making 'findings of fact' certainly does not authorize it to resolve conflicts in the evidence against the legislature's conclusion or even to reject the legislative judgment on the basis that . . . the legislative viewpoint constitutes nothing more than . . . 'pure speculation.' " *Id.* at 138-39.

In *Raymond Motor Transportation, Inc.* v. *Rice, supra,* the Court again faced the question of whether a state statute or regulation inhibiting the conveyance of goods in interstate commerce was unconstitutional under commerce clause analysis. The case involved a Wisconsin statute which disallowed trucks longer than fifty-five feet or pulling more than one vehicle to operate on Wisconsin highways without a permit. Regulations implementing the statute set forth the various conditions under which permits would be granted. The Court held that the challenged regulations violate the commerce clause because they substantially burdened interstate commerce and the state had failed to make even a colorable showing that the regulations contributed to highway safety.

The Court, however, may have divided somewhat on the proper test for commerce clause analysis. In the opinion for the Court Mr. Justice Powell, relying on *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970), appeared to approve balancing the burden on interstate commerce against the putative local benefits. Because the Wisconsin regulations were "clearly excessive in relation to the putative local benefits," *Raymond Motor Transportation, Inc.* v. *Rice, supra,* 434 U.S. at 442 (*citing Pike* v. *Bruce Church, Inc., supra,* 397 U.S. at 143), Mr. Justice Powell concluded that the regulations were an unconstitutional burden on interstate commerce.

Mr. Justice Blackmun, however, in a concurrence joined by three other justices,[1] used a different approach. Mr. Justice Blackmun noted that "if the safety justifications are not illusory, the Court will not second-guess legislative judgment about their importance in comparison with related burdens on interstate commerce." *Id.* at 449.

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[1] The Chief Justice, Mr. Justice Brennan, and Mr. Justice Rehnquist joined in Mr. Justice Blackmun's concurring opinion. Mr. Justice Stevens did not participate in the decision.

Neither opinion emanating from the *Raymond* Court mentioned the views previously set forth by Mr. Justice Black in *Brotherhood.*[2]

As a member of a district court twice reversed in the *Brotherhood* litigation,[3] I am, of course, reluctant to reject the *Brotherhood* decision without specific direction or to join in interring it in an unmarked grave.

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[2] In *Pike* v. *Bruce Church, Inc., supra,* the Supreme Court also failed to mention *Brotherhood.* The Fifth Circuit, citing a leading commentator, G. Gunther, Cases and Material on Constitutional Law 311 (1975), suggests that the *Brotherhood* approach may have at least in part been implicitly rejected because of its inconsistency with recent commerce clause decisions. *Great Western United Corp.* v. *Kidwell,* 577 F.2d 1256, 1282 n.54 (5th Cir. 1978), *rev'd sub nom. Leroy* v. *Great Western United Corp.,* 99 S.Ct. 2710 (1979).

[3] The *Brotherhood* case, originally styled *Chicago, R.I. & P. R. Co.* v. *Hardin,* 239 F.Supp. 1 (W.D. Ark. 1965), was brought before a three-judge court in the United States District Court for the Western District of Arkansas. That court decided the case without reaching the constitutional questions posed by the complaint. Defendants and intervenors, however, appealed to the United States Supreme Court which reversed and remanded for consideration of the constitutional questions. *Brotherhood of Locomotive Eng'rs* v. *Chicago, R. I. & P. R. Co.,* 382 U.S. 423 (1966). On remand, the three-judge district court held that evidence presented to the court required the conclusion that continued enforcement of the Arkansas statutes violated due process and unconstitutionally burdened interstate commerce. *Chicago, R.I. & P. R. Co.* v. *Hardin,* 274 F.Supp. 294 (W.D. Ark. 1967). The Supreme Court, however, again reversed, *Brotherhood of Locomotive Firemen & Enginemen* v. *Chicago, R.I. & P. R. Co., supra.*

IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF IOWA
CENTRAL DIVISION

Civil No. 78-179-1

[Filed Aug. 16, 1979]

CONSOLIDATED FREIGHTWAYS
CORPORATION OF DELAWARE,
Plaintiff,
vs.

RAYMOND KASSEL, *et al.,*
Defendants,
and

MOTOR CLUB OF IOWA,
Defendant-Intervenor.

MEMORANDUM OPINION AND ORDER

This is an action for declaratory and injunctive relief brought by Consolidated Freightways Corporation of Delaware (CF). It seeks to have Section 321.457(6) of the Iowa Code, which limits a combination of three vehicles coupled together to 60 feet, declared to be an unconstitutional burden on interstate commerce. It also alleges that certain exceptions to that limitation found in the statutes, departmental regulations, and permit and enforcement practices unconstitutionally discriminate against interstate commerce. The defendants are various responsible state officials. The Motor Club of Iowa, an affiliate of the American Automobile Association, was given permission to intervene on behalf of the defendants.

The relief requested is directed toward and limited to "Interstate Highways 80, 35, 280, 380, 29, 680, or 235, access routes to and from plaintiffs terminals, and reasonable access from said Interstate Highways to facilities for food, fuel, repairs or rest". The limitation of the issues to the Iowa Interstate System and reasonable access thereto has an important bearing on the Court's decision.

The trial lasted 14 days. The oral testimony was supplemented by a large number of depositions and hundreds of exhibits. It would unduly extend this opinion to review the evidence. The Court will state the findings of fact in narrative form as ultimate facts.

General Background

CF is one of the country's largest general commodity carriers. General commodity carriers usually transport small individual shipments between two points on its route structure. They deliver freight to destinations beyond their authority be interlining or interchanging with other general commodity carriers. They are obligated to provide timely, complete service under published rates to the public without discrimination. The basic pattern for the movement of LTL (less than a load) shipments is as follows: (1) pick up from the shipper; (2) consolidate with other shipments moving in the same direction at the originating terminal; (3) dispatch of the consolidated trailer load to a "break bulk" or reconsolidation terminal; (4) unload at the break bulk terminal and reconsolidate shipments from different points of origin moving to the same destination terminal; (5) dispatch the reconsolidated trailer load over-the-road to the destination area terminal; (6) unload the over-the-road trailer and reconsolidate shipments for logical local delivery service; and (7) deliver to the consignee. "Cross-dock" or break bulk handling creates delays, adds costs and exposes the freight to loss or damage. For efficient and economical operation it should be kept to a minimum.

CF operates in 46 states and has a complex system of routes, terminals and mainline driver relay stations. Computers are utilized to improve its efficiency and service. It has an intensive safety program including driver's qualification tests, safety meetings, periodic equipment inspections, driver's reports, patrolling safety supervisors, and accident investigations.

CF's standard combination of units for transcontinental movement of freight is a sixty-five foot twin which consists of a tractor, two 27 or 28 foot trailers and a dolly to connect the trailers. It also uses fifty-five foot semi-trailers, particularly in the areas of the county where twin trailers are prohibited. For Iowa use, it couples a 22 foot trailer with a 27 or 28 foot trailer. Although twins can carry more freight, CF is able to reduce the cross-dock handling by using two smaller trailers rather than one large one. Hereinafter reference to "twins" or "double bottoms" will mean a 65 foot combination of units. When the reference is to a double bottom of a different length, the length will be stated. "Semi" will be used to refer to a 55 foot combination of a tractor and one trailer.[1]

We are concerned here with CF's route that originates in the industrial east and distributes the products manufactured there at various locations west of Iowa and CF's route that originates in the Twin City area in Minnesota and distributes the freight south or west of Iowa. Of course, we are also concerned with the return trips.

Interstate 80 (I-80) which crosses Iowa, is a principal east/west transcontinental route. Twins are lawful its entire length except for Iowa, Pennsylvania and New Jersey. Interstate 35 (I-35) is a principal north/south route. Twins are lawful in all states it passes through except Iowa. CF generally uses twins on these routes, consequently, it must divert its trucks off of these interstates around Iowa. This diversion, caused by Iowa's restriction, generated this lawsuit.

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[1] Diagrams showing the configuration of the typical semi and twin are found in the appendix to Raymond Motor Transport, Inc. v. Rice, 417 F. Supp. 1352, 1363 (D. Wis. 1976).

Impact on Interstate Commerce

The diversion of twins around Iowa results in longer trips for those carriers that use twins. CF also diverts many of its semis around Iowa. This operational decision was made so that its driver relay system could function more efficiently. These added miles add to the cost of operation,[2] cause greater fuel consumption, increase the number of miles of highway that are subjected to wear and result in more accidents, injuries and fatalities. In the Court's opinion these undisputed facts create a substantial impact on interstate commerce. Raymond Motor Transportation, Inc. v. Rice, 434 U.S. 429, 445 (1978).

The question is whether this impact, under the facts and circumstances shown by the evidence in the case, creates an unconstitutional burden on interstate commerce.

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[2] The Iowa DOT estimated the increased cost of Iowa's limitation statute to be at least $12,644,000 annually based on 1974 carrier operating costs. CF offered evidence that the ban caused its vehicles to travel over 3,000,000 additional miles annually at an added cost of $2,000,000.

Professor Pogue, an economist, testified for defendants. He determined that CF's costs associated with the Iowa by-pass amounted to only 1/3 of one percent of its total operating costs. He concluded therefrom that the $2,000,000 estimate would have a minimal effect upon freight rates and consequently a minimal effect upon interstate commerce. In the Court's opinion, the extent of the burden on interstate commerce should not be determined by this type of calculation. The percentage figure is small because CF's operation is nationwide. The percentage would be much larger if the computation was based on the operation of a small regional carrier. The Court believes the factors mentioned in the opinion are proper considerations in determining the impact of interstate commerce. This is a case where cost is relevant to the issue of burden on commerce. *Raymond*, 434 U.S. at 445 fn. 21.

Burden on Interstate Commerce

The Commerce Clause of the United States Constitution prevents states from erecting barriers to the free flow of interstate commerce. However, state legislation designed to serve legitimate state interests that is applied without discriminating against interstate commerce, does not violate the Commerce Clause even though it affects interstate commerce. When legitimate local concerns overlap national interests represented by the Commerce Clause, and Congress has not acted, the Court must consider the weight and nature of the state regulatory concern in the light of the extent of the burden imposed on interstate commerce. Raymond Motor Transportation, Inc. v. Rice, 434 U.S. 429, 440-441 (and citations) (1978); Pike v. Bruce Church, Inc., 397 U.S. 137, 142 (1970); Bibb v. Navajo Freight Lines, 359 U.S. 520, 528-29 (1959).

When the legitimate local concern is highway safety, the Courts have given great deference to state regulations. Southern Pacific Co. v. Arizona, 325 U.S. 761, 783 (1945); Maurer v. Hamilton, 309 U.S. 598, 604 (1940); South Carolina Highway Dept. v. Barnwell Bros., 303 U.S. 177, 190-92 (1938); Sproles v. Binford, 286 U.S. 374, 390 (1932); Morris v. Duby, 274 U.S. 135, 143-44 (1927).

> These safety measures carry a strong presumption of validity when challenged in court. If there are alternate ways of solving a problem, we do not sit to determine which of them is best suited to achieve a valid state objective. Policy decisions are for the state legislature, absent federal entry into the field. Unless we can conclude on the whole record that 'the total effect of the law as a safety measure in reducing accidents and casualties is so slight or problematical as not to outweigh the national interest in keeping interstate commerce free from interferences

> which seriously impede it' * * * we must uphold the statute. Bibb v. Navajo Freight Line,s 359 U.S. 520, 524 (1959).

Quoted in *Raymond*, 434 U.S. at 443.

In his concurring opinion in *Raymond*, Justice Blackmun states:

> In other words, if safety justifications are not illusory, the Court will not second-guess legislative judgment about their importance in comparison with related burdens on interstate commerce.

434 U.S. at 449.

In *Raymond*, the Supreme Court held that a Wisconsin ban on 65 foot twins similar to the Iowa statute placed an unconstitutional burden on interstate commerce. As this case reaches the court in a far different posture than *Raymond*, all parties cite it and seek support for their various positions from it. There, the state "virtually defaulted in its defense of the regulations as a safety measure." 434 U.S. at 444. Here, the defendants made an all out effort to reinforce the "strong presumption of the validity" of the statutory limitation as a safety measure by extensive cross-examination and full presentation of evidence. The basis for the Supreme Court's decision was the uncontroverted evidence that 65 foot twins are as safe as, if not safer than, 55 foot semis. The Court stated:

> the challenged regulations violate the Commerce Clause because they place a substantial burden on interstate commerce and they cannot be said to make more than the most speculative contribution to highway safety.

Raymond, 434 U.S. at 447.

After a thorough review of the evidence bearing upon the relative safety of 65 foot twins, 60 foot twins and

55 foot semis, the Court can only conclude, in spite of defendants' efforts, that there is no valid safety reason for barring twins from Iowa's highways because of their configuration.

The evidence convincingly, if not overwhelmingly, establishes that the 65 foot twin is as safe as, if not safer than, the 60 foot twin and the 55 foot semi. Many of the studies relied on to support this position were not designed to answer this specific question and did not eliminate possible biases. Therefore, they were not statistically acceptable. However, they were of some value as evidence. Some of the biases favored semis. Some favored twins. Nevertheless, these studies, including one by Iowa's DOT in 1975, indicated that overall, the twin is as safe as a semi or a 60 foot twin. State highway officials from the surrounding states unanimously agreed that twins were as safe as the trucks now legal in Iowa. CF's experts on highway safety were of the same opinion. None of defendants' experts stated that twins were not as safe as semis overall.[3] Although some drivers preferred the handling characteristics of semis over twins, none felt that twins were unsafe. CF's own statistics and its "matched pair analysis" are strong support for the finding that there is little, if any, difference in the safety of semis, 60 foot twins or 65 foot twins.

Twins and semis have different characteristics. Twins are more maneuverable, are less sensitive to wind, and create less splash and spray. However, they are more likely than semis to jackknife or upset. They can be backed only for a short distance. The negative characteristics are not such that they render the twin less safe than semis overall. Semis are more stable but are more likely to "rear end" another vehicle.

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[3] See Fn. 3 attached to this opinion as an appendix for a discussion of defendant's expert testimony.

The added length of the twin is not a substantial factor on four lane divided highways. The state by legalizing the 65 foot automobile carrier has weakened its claim that the extra length creates a safety hazard. It has practically destroyed its argument that double trailers are an additional safety hazard by legalizing the 60 foot twin. The uncontradicted evidence established that the extra five feet in length makes the 65 foot twin more stable than the 60 foot twin.

Defendants claim that the evidence is inconclusive on the relative safety issue, and it is a reasonable policy decision for Iowa to make a safety distinction between twins and semis. Defendants argue that they should prevail because of the strong presumption. The Court cannot accept this argument as it believes that the evidence clearly establishes that the twin is as safe as the semi.

If the extent of the burden placed on interstate commerce were to be weighed against the additional safety hazards created by the configuration of the twins alone, the Court would hold, without further discussion, that the legislation excluding twins has so slight or problematical effect in reducing accidents or casualties that its value as a safety measure does not outweigh the national interest in keeping interstate commerce free from interferences which seriously impede it. It may be, under *Raymond*, that the inquiry should end at this point.

However, as one reads *Raymond*, one senses the reluctance of the Supreme Court to decide the case as it felt it must under the inadequate defense raised by the State of Wisconsin. Justice Powell uses terms like "default", "overwhelming one sided evidence", and "uncontroverted evidence". In his concurring opinion, Justice Blackmun characterizes the Court's decision as a "conclusion that safety interests have not been show to exist as a matter of law". 434 U.S. at 450. Previous pertinent cases are cited, quoted and explained without any indication that the Court intends to make a substantial departure from previous holdings. The Court restates its reluctance to invalidate state highway safety regulations under the Commerce Clause as the propriety of local regulation in this area has been long recognized. 434 U.S. at 443. Justice Powell concludes his opinion by saying:

> Our holding is a narrow one, for we do not decide whether laws of other States restricting the operation of trucks over 55 feet long, or of double-trailer trucks, would be upheld if the evidence produced on the safety issue were not so overwhelmingly one-sided as in this case.

434 U.S. at 447.

Although the Court has concluded that the evidence clearly establishes that the twins are as safe as, if not safer than semis, it believes that the tenor of the opinion is such that the other reasons advanced by the defendants in support of the limitation must be closely examined.

If the length limit for twins was raised from 60 feet to 65 feet, there would be a substantial increase in the number of trucks using Iowa's interstate system. The 1975 report of the Iowa DOT entitled Sixty-five Foot Twin Tailers in Iowa—Perspective, predicted that at that time an additional 206 trucks would use the highways each day for a total of 75,000 additional truck trips annually. Current estimates are about 10 per cent higher. The increased truck traffic would mean an increase in the number of accidents and fatalities in Iowa. The traffic mix between trucks and cars would be less favorable and the trend toward smaller cars would increase the possibility of more serious accidents. Automobile insurance rates would tend to increase and the need for additional highway patrolmen would be intensified. Iowa's citizens would be adversely affected by the increased wear on the interstate highways and the consumption of additional quantities of its limited supply of fuel.

On the positive side, the taxes and fees paid by the twins would more than offset the cost of the additional damage to the highways, if the proceeds were all applied to the interstate system. Iowans would derive substantial economic benefits from the additional traffic.

Both Governor Ray and Robert Rigler, Chairman of the DOT Commission, emphasized the importance of protecting the interests and welfare of Iowa's citizens from the negative consequences of the increased traffic. As the legislature has not changed the law, it is apparent that Iowa's policy makers have decided that the disadvantages of increasing the length limitation outweigh the benefits that would result. These are legitimate local concerns which are entitled to consideration in making the "delicate adjustment of the conflicting state and federal claims". H.P. Hood & Sons, Inc. v. Du Mond, 336 U.S. 525, 553 (1948).

On the other hand it is equally clear that Iowa's length restriction causes the trucks affected by the ban to travel more miles over more dangerous roads in other states which means a greater overall exposure to accidents and fatalities. More miles of highway are subjected to wear. More fuel is consumed and greater transportation costs are incurred.

We therefore have before us a situation in which matters of legitimate local concern not only overlap with the national interests expressed by the Commerce Clause, but safety and economic interests of other states in particular and the nation as a whole. The resolution of this conflict "necessarily involves a sensitive consideration of the weight and nature of the state regulatory concern in light of the extent of the burden imposed on the course of interstate commerce". *Raymond, supra,* 434 U.S. at 441.

A prime consideration in the "delicate adjustment" process must be the fact that we are dealing with the interstate system. In Iowa, it is composed of four or more lane divided highways with limited access. Roads connected to the interstate are incidently affected. Iowa's interstates are part of a national network of highways designed to provide fast and efficient transportation across the country. Ninety percent of the costs was financed by federal funds. Some funding is now being provided by the federal government for major resurfacing and reconstruction projects. Federal standards must be met. The system is intended to serve the needs of interstate traffic. The cases, which stressed the "peculiarly local concerns" in the use of the state's highways, Morris v. Duby, supra, (1927); Sproles v. Binford, supra, (1932); South Carolina Highway Department v. Barnwell Bros., supra (1938); and Maurer v. Hamilton, supra, (1940), all antedated the establishment of the interstate system. Their holdings were summarized in the following language in Southern Pacific Co. v. Arizona, 325 U.S. 761, 783 (1945):

> [In *Barnwell*] and in Maurer v. Hamilton, supra, we were at pains to point out that there are few subjects of state regulation affecting interstate commerce which are so peculiarly of local concern as is the use of the state's highways. Unlike the railroads local highways are built, owned and maintained by the state or its municipal subdivisions. The state is responsible for their safe and economical administration. Regulations affecting the safety of their use must be applied alike to intrastate and interstate traffic. The fact that they affect alike shippers in interstate and intrastate commerce in great numbers, within as well as without the state, is a safeguard against regulatory abuses. Their regulation is akin to quarantine measures, game laws, and like local regulations of rivers, harbors, piers, and docks, with

> respect to which the state has exceptional scope for the exercise of its regulatory power, and which, Congress not acting, have been sustained even though they materially interfere with interstate commerce (303 U.S. at 187-188 and cases cited).

Raymond continues the great deference to state regulations to promote highway safety within the state, 434 U.S. at 443, but it recognizes the emergence of the interstate system, 434 U.S. at 444, fn. 19.

Because of the important part the federal government plays in the design, construction, maintenance and regulation of interstates, many of the reasons given by the Court for allowing states wide discretion in regulating highways do not apply to interstates. If it had not been shown that twins are as safe as semis, *Raymond* would support a finding that the limitation did not unconstitutionally burden interstate commerce. The strong presumption of its validity as a safety measure, to keep less safe vehicles off of Iowa's highways, would have prevailed. But, if the safety consideration is the reduction of accidents and casualties in Iowa by diverting traffic around Iowa with an overall increase in accidents elsewhere, the fact that interstate highways are involved becomes an important factor in the decision. There is a parochialism about such a local approach to public health and safety, that gives it less weight in the balance between legitimate local concerns for the health and economic welfare of its citizens and the burden on interstate commerce. It has the aura of protectionism usually associated with discrimination against interstate commerce.

There are situations in which regulations intended to limit the amount of traffic on a particular highway would be a legitimate safety measure. Bradley v. Public Utilities Commission, 289 U.S. 92, 96 (1933). But, here, the evidence shows that no such congestion exists on Iowa's interstate roads. The "level of service" offered the public is quite high. Only in localized urban situations during the rush hour does congestion become a problem. The percentage of trucks on the interstate during these periods is quite small.

In the Court's opinion the balance here must be struck in favor of the federal interests. The *total effect* of the law as a safety measure in reducing accidents and casualties is so slight and problematical that it does not outweigh the national interest in keeping interstate commerce free from interferences that seriously impede it. Legitimate local concerns are outweighed by the burden the limitation places on interstate commerce.

The Court is not particularly comfortable with this result. The long established reluctance of the courts to interfere with State policy on the weight, width and length of vehicles permitted on its highways is being eroded. The public policy of the State of Iowa has been that it is for the best interest of its citizens to limit the length of twins to 60 feet. The public policy of the surrounding states for reasons known to them raised the limit to 65 feet. Apparently they made a policy decision that the advantages of permitting twins outweighed the disadvantages. Here, the Interstate Commerce Clause is being used to force Iowa to abandon its chosen public policy. The trucking industry has long played leap frog with weight and length limitations to achieve alternate increases. Truckers that haul products that "cube out" before they "weigh out" ask for an increase in length of a few feet so they can take advantage of the weight limit. Then those truckers that haul products that "weigh out" before they "cube out" ask for weight increases so they can utilize the additional length. It is not difficult to establish that the small increase in weight or length creates no additional safety hazard or damage to highways. With some officials saying 108 foot triple-bottoms impose no additional safety hazard on interstates, there appears to be no end in sight.

If this concern points to anything of particular significance, it is that the interstates should be treated differently than other highways. Regulations regarding the length, width and weight of vehicles using the interstate system should be uniform. Congress should pre-empt this area of the law and set these standards. Creeping increases in weight and length limitations would then be subject to national scrutiny and the national will. State by state action would be eliminated. But, even if Congress fails to act, the courts should consider the involvement of interstate highways an important factor in weighing local concerns against the extent of the burden on interstate commerce.

Discrimination against Interstate Commerce.

Section 321.457(6) of the Iowa Code which limits the length of a combination of three vehicles to 60 feet is neutral on its face. However, CF claims that certain statutory exceptions and exemptions, provisions for trip or annual permits and enforcement policies do, in effect, discriminate against interstate commerce. As the Court has concluded that section 321.457(6) places an unconstitutional burden on interstate commerce, it is not necessary to make a detailed analysis of CF's claims in this regard. However, limited comments may be helpful to the reviewing court.

Whether state legislation is designed to protect the health, safety and welfare of its citizens or is intended to forge an economic preference for its own commercial interests, the legislative purpose cannot be accomplished by discriminating against interstate commerce. A state cannot isolate itself from a problem common to many by erecting a barrier against the movement of interstate trade. Philadelphia v. New Jersey, 437 U.S. 617, 626-28

(1978). The crucial inquiry is whether the questioned statute, regulation, or permit procedure is basically a protectionist measure or whether it can fairly be viewed as a law directed to legitimate local concerns, with effects upon interstate commerce that are only incidental. Philadelphia v. New Jersey, supra, 437 U.S. at 624.

Some questions might well be raised as to the standing of CF to make claims of discrimination because there is little, if any, relationship between the nature of its operation and the nature of the exceptions and exemptions complained of. However, as the Court concludes that there is no unconstitutional discrimination against interstate commerce, standing will be assumed.

Section 321.457(7) Code of Iowa empowers a border city to enact a municipal ordinance authorizing vehicles which meet the width and length limitations of the abutting state to operate within its city limits. CF could take advantage of any ordinance passed under this section. CF did not establish that the state permits twins to operate in border cities that have not passed such ordinance. This exception does not permit these vehicles to operate on highways of the state outside of the border cities. It is consistent with the state policy of protecting its highways and citizens from additional twin traffic across the state.

Section 321.457(3) authorizes the transportation of livestock in 60 foot semi-trailers. No distinction is made between intrastate and interstate commerce. It is a rational legislative decision and does not discriminate against 65 foot twins.

Section 321.457(4) allows the movement of mobile homes up to 48 feet in length if the length of the combination does not exceed 60 feet. As this is an indivisible load, it would be impossible to move a mobile home in Iowa without such exception. "The uses of the highways for this sort of transportation are temporary only and essential to the public welfare." Sproles v. Binford, 286 U.S. 374, 386 (1932).

Section 321E.28 empowers the Iowa DOT and local authorities to issue single trip permits to move larger mobile homes and factory built structures when the point of origin, or destination, is in Iowa. Severe restrictions are placed on such movement. This section strengthens Iowa's committment to highway safety while it makes a reasonable accommodation for the needs of its citizens and the flow of commerce. Section 321.457(5) permits the use of a combination of vehicles 60 foot long to transport boats, automobiles, light trucks, farm and industrial tractors, implements of husbandry and travel trailers. Boats, cars and light trucks may overhang the front or rear of the vehicle three feet if the load does not exceed 65 feet in length. There is no discrimination against interstate commerce. The exception does weaken the presumption of safety as it relates to the length of combinations of vehicles.

Section 321E.10 authorizes the issuance of annual permits for the movement of truck trailers manufactured or assembled in Iowa in a combination of two or more vehicles that does not exceed 70 feet to other points of manufacture or assembly in Iowa or to a point outside the state. Such movement is subject to severe restrictions which include the requirements that they move over the most direct route on highways at least 24 feet wide with no freight or additional load at speeds not in excess of 45 miles per hour. The restrictions again reveal the legislature's strong concern for highway safety while making a reasonable accommodation to the practical needs of its citizens.

The Iowa Code authorizes the Governor of Iowa to proclaim a state of emergency "to protect the public peace, health and safety, and to preserve the lives and property of the people of the state". Sections 29C.1 and 29C.3(1). The Governor has exercised this authority to permit longer and heavier vehicles to temporarily use Iowa's highways when shortages of fuel and livestock feed occurred. These proclamations did not unconstitutionally discriminate against interstate commerce.

The Court is of the opinion that none of the pertinent regulations discriminate against interstate commerce. The Court is also of the opinion that CF did not establish unequal or improper enforcement of the law or regulations. Discriminating enforcement constituting a discrimination against interstate commerce was not proven.

Conclusion.

The law provides a strong presumption that Section 321.457(6) of the Iowa Code limiting the length of a combination of three vehicles completed together to 60 feet is a valid public highway safety measure. Plaintiff successfully rebutted that presumption by showing that 65 foot twins are as safe as 60 foot twins and 55 foot semis. There is some benefit to Iowa citizens from the other reasons advanced for the limitation and they are legitimate local concerns. However, the burden imposed on interstate commerce is clearly excessive when related to the putative benefits received in Iowa from the limitation. The limitation imposed by section 321.457(6) cannot stand when applied to the Iowa Interstate Highway System.

IT IS THEREFORE ORDERED, ADJUDGED AND DECREED by the Court that Section 321.457(6) Code of Iowa 1977 is unconstitutional as applied to 65 foot twin trailers insofar as it places greater restriction on their operation than on the operation of 60 foot twin trailers or 55 foot semi-trailers on Iowa Interstate Highways 80, 35, 280, 380, 29, 680 and 235 and roads furnishing reasonable access between said interstates and terminals and facilities for fuel, food, repairs, or rest. The Court would view any distance greater than five miles as unreasonable. A shorter distance might be unreasonable if closer facilities are available.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED by the Court that the defendants and any other official of the State of Iowa under defendants' control, direction or authority are hereby enjoined from enforcing section 321.457(6) Code of Iowa 1977 against the operation of 65 foot twin trailers on Interstate Highways 80, 35, 280, 380, 29, 680 and 235 and roads furnishing reasonable access between said interstates and terminals and facilities for fuel, food, repairs, or rest to any greater degree than the 60 foot twin trailers and 55 foot semitrailers are limited or burdened thereby.

Signed this 16 day of August, 1979.

/s/ W. C. Stuart
W. C. Stuart
Chief Judge
Southern District of Iowa

APPENDIX

3. The Court believes its conclusion requires that reference be made to the testimony of defendants' experts.

> *Dr. Koehler*, a statistician, effectively pointed out the deficiencies in the various studies from a statistical standpoint. The studies were not specifically designed to test the comparative safety of twins and semis. They failed to eliminate or control important possible biases. He approved the methodology used by Cf in compiling its "matched pair analysis", which compared the accident, injury and fatality records of twins and semis on an equal number of identical trips over the same route on a month-by-month basis for the year 1978. Each type of vehicle made 188,296 trips. Each type traveled over 56,000,000 miles. In the matched pair analysis, the semis were involved in 100 accidents resulting in 27 injuries and 1 fatality. The twins were involved in 106 accidents resulting in 17 injuries and 1 fatality.
>
> Dr. Koehler was of the opinion that the sample was too small to make these results statistically significant because of the small number of accidents, injuries and fatalities. He felt the matched pair analysis indicated no "extremely gross" differences in accident rates, and provided slight to moderate evidence that the injury rate for twins was lower. He would have liked to have had the accident information for at least 3 years, but could think of no better way to eliminate the biases with the data available.
>
> *Dr. Hall*, a mechanical engineer, had had no experience with highway construction or highway safety engineering. He obtained information from the comprehensive experiment and study by the American Association of State Highway Transportation Officials (AASHTO) conducted in about 1955 relating to highway wear and design to make calculations con-

cerning the comparative damage to flexible (asphaltic) concrete highways caused by semis and twins. These computations are not acceptable because the figures used in the formula (SN numbers) were not applicable to the design of asphaltic concrete used on the interstates in Iowa. He also used "Bulley data" presented to a congressional committee relating to the "average road in the United States" to reach the conclusion that twins would cause more damage to the average road than semis. Such a computation is meaningless and has no relevance here. The percentages of Iowa interstates surfaced with portland cement and asphaltic concrete are known. A large portion is portland cement. Semis cause more damage to this type of pavement. Twins cause more damage to ordinary asphaltic concrete. There is a conflict in the evidence as to which formula should be used in calculating damage to "deep strength asphalt" also used on portions of Iowa's interstates. The mileage is not a significant factor here.

Dr. Peters is self-employed as a mechanical engineering consultant. He had read considerable scientific material relating to braking and based his analysis of stopping abilities of twins and semis on that literature. He found that CF had good maintenance procedures. In his opinion twins brakes would be more apt to malfunction than semis because there were more parts in the system to fail. He expressed no opinion as to the overall safety of the twins compared to semis or 60 foot twins. He gave testimony concerning splash and spray from trucks passing over a wet surface and passing maneuvers for which no foundation was laid entitling him to express such opinions. He relied upon his driving experience and was in no better position to state such opinion than the average driver.

Mr. Wandling, a consulting engineer, testified that in his opinion a twin has "less yaw stability and greater amplification of lateral acceleration than a semi", but had no opinion as to how significant it might be under present conditions and the limited information available. Much of the foundation for that opinion was based upon a Michigan study of a double-bottom tanker. The study and a film disclosed that this vehicle had a dangerous propensity to upset under a not unusually severe maneuver to change lanes. The CF van twin is entirely different from the Michigan double-bottom tanker. A film of the identical test performed with the CF van discloses no such dangerous propensity. Mr. Wandling had no opportunity to see this film. The Court accepts Mr. Wandling's opinion that a twin has less yaw stability and greater amplification of lateral acceleration than a semi to some unidentified extent.

There is an indirect relationship between maneuverability and stability. The more maneuverable a vehicle is, the less stable it becomes. In the case of semis, some maneuverability has been sacrified for greater stability. In the case of twins, some stability has been sacrificed for greater maneuverability. These choices do not mean that either vehicle is unsafe or that one is less safe overall than the other.

The Court is of the opinion that Dr. Hall, Dr. Peters and Mr. Wandling were not particularly well qualified to testify about the matters presented to them. Their real expertise lies in other areas.

Dr. Carstens, a civil engineer with a doctorate in transportation engineering, had engaged in studies relating to traffic conflicts which he defined as the possibility that two vehicles might desire to occupy the same road space at the same time requiring one or both to take some evasive action (turning, braking, speeding up, etc.) to avoid a collision. He was asked to look at the potential for increased accidents if vehicle length were increased from 60 to 65 foot. He made a field survey at one exit from I-35 and I-80 near Des Moines. Observors tabulated the length of time combination vehicles encroached on two lanes at right angles to the direction the trucks were traveling at the intersection. He computed the average rate of acceleration of the trucks for various maneuvers and calculated the additional time that the extra five feet would encroach upon the right-angle lanes. He prepared a chart showing the probability of the occurrence of a "suitable gap" occuring in traffic at various traffic volumes so that the 60 or 65 foot truck could make the maneuver without creating a traffic conflict.

The charts, tables and plats were all interesting but of little practical value. When the table reached the point that there would be no suitable gap for a 60 foot truck to enter a traffic stream of 2000 vehicles per hour until 333,000 vehicles had passed and one suitable gap for a 65 foot truck about every 500,000 vehicles, the calculations lost all significance. The practical fact is that it would take a 65 foot vehicle only a fraction of a second longer to make the maneuver than a 60 foot truck. It did not take these complex tables and calculations to support the witnesses obvious conclusion that "an inescapable result of the increase in vehicle length is an expectation of an increase in accidents because of the type of maneuvers that they have to make in entering and crossing and diverging from traffic stream, and the fact that upon opposing traffic lanes is of necessity a direct function of the length of that vehicle." There was however no attempt to place this increased exposure to accidents in a practical context. The Court does not believe the extra five feet would create a significant additional safety hazard in performing the maneuvers described by the witness.

UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

No. 79-1709

RAYMOND KASSEL, *et al.*,
Appellants,
v.

CONSOLIDATED FREIGHTWAYS
CORPORATION OF DELAWARE,
a Delaware Corporation
Appellee.

NOTICE OF APPEAL TO THE SUPREME COURT OF THE UNITED STATES

Notice is hereby given that Raymond Kassel, et al., the Appellants above-named, hereby appeal to the Supreme Court of the United States from the final judgment of this Court declaring Iowa Code § 321.457(6) repugnant to Article I, Section 8 of the Constitution of the United States entered in this action on December 7, 1979.

This appeal is taken pursuant to 28 U.S.C. § 1254(2).

THOMAS J. MILLER
Attorney General of Iowa

/s/ Mark E. Schantz
MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50319
(515) 281-5191

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General
Attorneys for Appellants

I hereby certify that on this 1st day of February, 1980, copies of this NOTICE OF APPEAL were mailed, postage prepaid to John H. Lederer, Esq., 121 South Pinckney Street, Madison, Wisconsin 53703, and to Terry C. Hancock, Esq., 1100 Des Moines Building, Des Moines, Iowa 50309, Counsel for Appellees.

/s/ Mark E. Schantz
MARK E. SCHANTZ

Supreme Court, U.S.
FILED
AUG 8 1980
[illegible] RODAK, JR., CLERK

APPENDIX

In The
Supreme Court of the United States
October Term, 1979

No. 79-1320

Raymond Kassel, Robert Rigler, L. Stanley Schoelerman, Donald Gardner, Jules Busker, Allan Thoms, Barbara Dunn, William McGrath, Jon McCoy, Charles W. Larson, Edward Dickinson, Richard C. Turner, and Robert D. Ray,
Appellants,
vs.
Consolidated Freightways Corporation of Delaware, a Delaware Corporation,
Appellees.

ON APPEAL FROM THE UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

APPEAL DOCKETED FEBRUARY 26, 1980
JURISDICTION NOTED MAY 19, 1980

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, ROBERT RIGLER, L. STANLEY SCHOELERMAN, DONALD GARDNER, JULES BUSKER, ALLAN THOMS, BARBARA DUNN, WILLIAM MCGRATH, JON MCCOY, CHARLES W. LARSON, EDWARD DICKINSON, RICHARD C. TURNER, and ROBERT D. RAY,

Appellants,

vs.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, a Delaware Corporation,

Appellees.

ON APPEAL FROM THE UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

OPINIONS BELOW

[The Opinions of the District Court and Court of Appeals were printed in the Appendix to the Jurisdictional Statement, and are omitted from this Appendix.]

CHRONOLOGICAL LIST OF RELEVANT DOCKET ENTRIES

DISTRICT COURT FOR THE SOUTHERN DISTRICT OF IOWA

June 13, 1978	—Plaintiff Consolidated Freightways filed its Complaint and Motion for Preliminary Injunction on the U.S. District Court for the Southern District of Iowa.
July 5, 1978	—Defendants' Original Answer filed.
July 26, 1978	—Defendant-Intervenor's Answer filed.
January 22, 1979	—Amended Complaint filed.
February 2, 1979	—Amended Answer of Defendants filed.
May 29, 1979	—Amended Answer of Defendant-Intervenors filed.
June 5, 1979	—Trial Commenced.
June 27, 1979	—Trial Evidence Closed.
August 16, 1979	—Memorandum Opinion, Order, and Judgment entered.
August 17, 1979	—Notice of Appeal filed.
August 20, 1979	—Motion for stay pending appeal denied by District Court.

EIGHTH CIRCUIT COURT OF APPEALS

September 10, 1979—Motion for stay pending appeal denied by 8th Circuit Court of Appeals.

October 11, 1979 —Oral argument before 8th Circuit Court of Appeals.

December 7, 1979 —District Court decision affirmed.

February 1, 1980 —Defendants Notice of Appeal filed.

May 19, 1980 —Probable Jurisdiction noted.

AMENDED COMPLAINT

Filed January 22, 1979

[Caption Omitted in Printing]

NOW COMES the Plaintiff, Consolidated Freightways Corporation of Delaware, a Delaware corporation, and for a Complaint against the above-named Defendants alleges as follows:

I. JURISDICTION

1. This Honorable Court has jurisdiction of this controversy under 28 USC § 1331, 28 USC § 1332, 28 USC § 1343, 42 USC § 1983 and 28 USC § 2201-02.

2. Plaintiff Consolidated Freightways Corporation of Delaware is a Delaware corporation with its principal place of business at 175 Linfield Drive, Menlo Park, California.

3. Defendant Raymond Kassel is the Director of Transportation, State of Iowa, and on information and belief resides at 913 Eleventh Street, Nevada, Iowa 50201.

4. Defendant Robert Rigler is a member and the Chairman of the Transportation Commission, State of Iowa, and on information and belief resides at 251 South Locust Avenue, New Hampton, Iowa 50659.

5. Defendant L. Stanley Schoelerman is a member of the Transportation Commission, State of Iowa, and on information and belief resides at 307 East Fourth, P. O. Box 390, Spencer, Iowa 51301.

6. Defendant Don Gardner is a member of the Transportation Commission, State of Iowa, and on information and belief resides at 3110 Ravenwood Terrace, NW, Cedar Rapids, Iowa 52405.

7. Defendant Jules Busker is a member of the Transportation Commission, State of Iowa, and on information and belief resides at 2902 Jackson, Sioux City, Iowa 51104.

8. Defendant Allan Thoms is a member of the Transportation Commission, State of Iowa, and on information and belief resides at 510 St. George Street, Dubuque, Iowa 52001.

9. Defendant Barbara Dunn is a member of the Transportation Commission, State of Iowa, and on information and belief resides at 530 - 44th Street, Des Moines, Iowa 50312.

10. Defendant William McGrath is a member of the Transportation Commission, State of Iowa, and on information and belief resides at Box 36, Melrose, Iowa 52569.

11. Defendant Jon McCoy is Director of the Motor Vehicle Division, State of Iowa, and resides at 1412 Harding, Ames, Iowa 50010.

12. Defendant Charles W. Larson is Commissioner of the Department of Public Safety, State of Iowa, and on information and belief resides at Rural Route 2, Bittersweet, Newton, Iowa 50208.

13. Defendant Col. Edward Dickinson is Chief of the Iowa Highway Patrol, Department of Public Safety, State of Iowa, and on information and belief resides at 1105 SE Innsbruck Drive, Ankeny, Iowa 50021.

14. Defendant Richard C. Turner is Attorney General, State of Iowa, and on information and belief resides at 1054 - 21st Street, West Des Moines, Iowa 50265.

15. Defendant Robert D. Ray is Governor of the State of Iowa, and on information and belief resides at 2300 Grand Avenue, Des Moines, Iowa 50312.

16. This controversy is between citizens of different states.

17. This action arises under Article I, Section 8, and the Fourteenth Amendment of the United States Constitution and 42 USC § 1983, as more fully appears hereafter.

18. The amount in controversy exclusive of interests and costs exceeds $10,000.00.

II. FIRST CAUSE OF ACTION

19. Plaintiff Consolidated Freightways is a common carrier duly certificated by the Interstate Commerce Commission under Certificate of Public Convenience and Necessity MC-42487 and various subnumbers thereunder. It holds authority to operate as a common motor carrier of general commodities (exluding certain commodities in bulk, certain commodities requiring special handling, household goods, and certain explosives) in interstate and foreign commerce.

20. Pursuant to its operating authority, Plaintiff routinely transports general commodities among customers located in 46 states and Canada. Plaintiff transports general commodities between points where the most direct, efficient, and rapid routing would be through Iowa, and Plaintiff transports general commodities between customers served by its terminals located in Cedar Rapids, Iowa and Des Moines, Iowa, and other points in its system, and in interline service.

21. Interstate 80, beginning in the New York metropolitan area and terminating in the San Francisco metropolitan area is the principal east-west transcontinental highway in the United States, and provides the most direct route for general commodities from the Chicago area and points east to the central West Coast. Inter-

state 80 runs through Iowa from Davenport to Council Bluffs.

22. Interstate 36, beginning in Laredo, Texas and ending in Duluth, Minnesota is a principal, north-south interstate routing through Iowa from a point near Silver Lake, Iowa to a point near Lamoni, Iowa.

23. Interstate 235, is an alternate routing of Interstates 80 and 35 through the Des Moines, Iowa area.

24. Interstate 380, is a connector route connecting Cedar Rapids, Iowa with Interstate 80.

25. Interstate 280 is an alternate routing of Interstate 80 around and through the Moline-Rock Island-Davenport metropolitan area.

26. Interstate 680 is an alternate routing connecting Interstate 80 with Interstate 29 in the Council Bluffs area.

27. Interstate 29, beginning in Kansas City, Missouri and ending at the Canadian border at North Dakota, runs through Iowa from a point near Hamburg, Iowa to Sioux City, Iowa.

28. Attached hereto and incorporated herein are the following:

(a) Exhibit A: a map showing the national Interstate Highway System.

(b) Exhibit B: a map showing the portion of the National Interstate Highway System in Iowa.

(c) Exhibit C: a map showing the routing to Plaintiff Consolidated Freightways' terminal in Des Moines, and

(d) Exhibit D: a map showing the routing to Plaintiff Consolidated Freightways' terminal in Cedar Rapids.

29. A 65-foot twin trailer vehicle combination ("twin trailer") is the standard vehicle for interstate carriage of general commodities in the United States other than in the East Coast and Southeast regions. The vehicle combination consists of a truck-tractor, a trailer approximately 27 or 28 feet in length, a dolly and a second trailer approximately 27 or 28 feet in length. The entire vehicle combination has a length of 65 feet. Attached hereto and incorporated herein as Exhibit E are diagrams illustrating 27 foot twin trailers in combination and 28 foot twin trailers in combination.

30. Plaintiff Consolidated Freightways owns and operates twin trailers in those states where they are legally permissible, and routinely interchanges twin trailer equipment both within its own operations and with other carriers to provide service to and from areas where Plaintiff Consolidated Freightways is not authorized to provide direct service.

31. Section 321.457(6), Code of Iowa, 1977, prohibits the operation of standard sixty-five foot twin trailers in Iowa:

> "No combination of three (3) vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and back bumpers in excess of sixty feet."

32. As a direct consequence of this prohibition, Plaintiff Consolidated Freightways is forced to:

(1) divert through traffic from the most direct routing through Iowa to circuitous routings around Iowa;

(2) operate equipment to serve Iowa customers which is incompatible with its other equipment and with the equipment of other carriers with whom it interchanges equipment; and

(3) operate shuttle operations between other states and terminals in Iowa in which twin trailers are handled separately in single trailer-single tractor units between Iowa terminals and staging areas maintained near the Iowa border.

33. As a consequence of the Iowa ban, Plaintiff Consolidated Freightways' operations are disrupted and fragmented, its operating costs are significantly increased, and it is unable to provide prompt, efficient interstate transportation of goods.

34. Standard sixty-five foot long twin trailers are as safe or are safer than fifty-five foot semi-trailers or sixty foot twin trailer type vehicles which are permitted to operate regularly and routinely in Iowa.

35. Standard sixty-five foot twin trailers cause no greater road wear than is caused by fifty-five foot semi-trailers or sixty foot twin trailers which are permitted to operate regularly and routinely in Iowa.

36. Certain of Defendants and/or their predecessors in office have conducted or caused to be conducted, studies of sixty-five foot twin trailers. Said studies have indicated that twin trailers are as safe or safer and cause no more road wear than sixty foot twin trailer type vehicles and fifty-five foot semi-trailer vehicles.

37. Iowa has created statutory and administrative exceptions to its general limitations on length which permit the operation in Iowa of vehicles longer than the State's general length limitations, including sixty-five foot twin trailers, where the operations of such vehicles are of principal benefit to Iowa industry, business, and residents.

38. The burdens placed on interstate commerce by the Iowa ban are not justified by legitimate local concerns or interest, are discriminatory, and violate Article I, Section 8 of the United States Constitution.

III. SECOND CAUSE OF ACTION

39. Plaintiff realleges paragraphs 1 through 38 of this Complaint.

40. The actions of Defendants violate the Fourteenth Amendment of the United States Constitution.

IV. THIRD CAUSE OF ACTION

41. Plaintiff realleges paragraphs 1 through 40 of this Complaint.

42. The actions of Defendants are done under color of state law.

43. The actions of Defendants violate 42 USC § 1983.

V. RELIEF REQUESTED

WHEREFORE, on each of the causes of action, Plaintiff requests that this Honorable Court:

1. Enter a declaratory judgment holding that § 321-.457(6), Code of Iowa, 1977, and any other statute, regulation, or ordinance which places greater restrictions on the question of sixty-five foot twin trailers than are placed on the operation of fifty-five foot semi-trailers or sixty foot twin trailers on Interstate Highways 80, 35, 280, 380, 29, 680, and 235, access routes to and from Plaintiff's terminals, and reasonable access from said Interstate Highways to facilities for food, fuel, repairs, or rest are unconstitutional.

2. Enter an injunction restraining Defendants, and any other official of the State of Iowa, operating under Defendants' control, authority, or direction, and any other official charged with the enforcement of laws, or regulations, or ordinances, of the State of Iowa, or of any subdivision, local government or municipality there-

of, from enforcing § 321.457(6), Code of Iowa, 1977), or any other statute, regulation, or ordinance that would limit or burden the operations of sixty-five foot twin trailers on Interstate Highways 80, 35, 280, 380, 29, 680, or 235, access routes to and from Plaintiff's terminals, and reasonable access from said Interstate Highways to facilities for food, fuel, repairs, or rest, to a greater degree than the operation of trucks generally is limited or burdened.

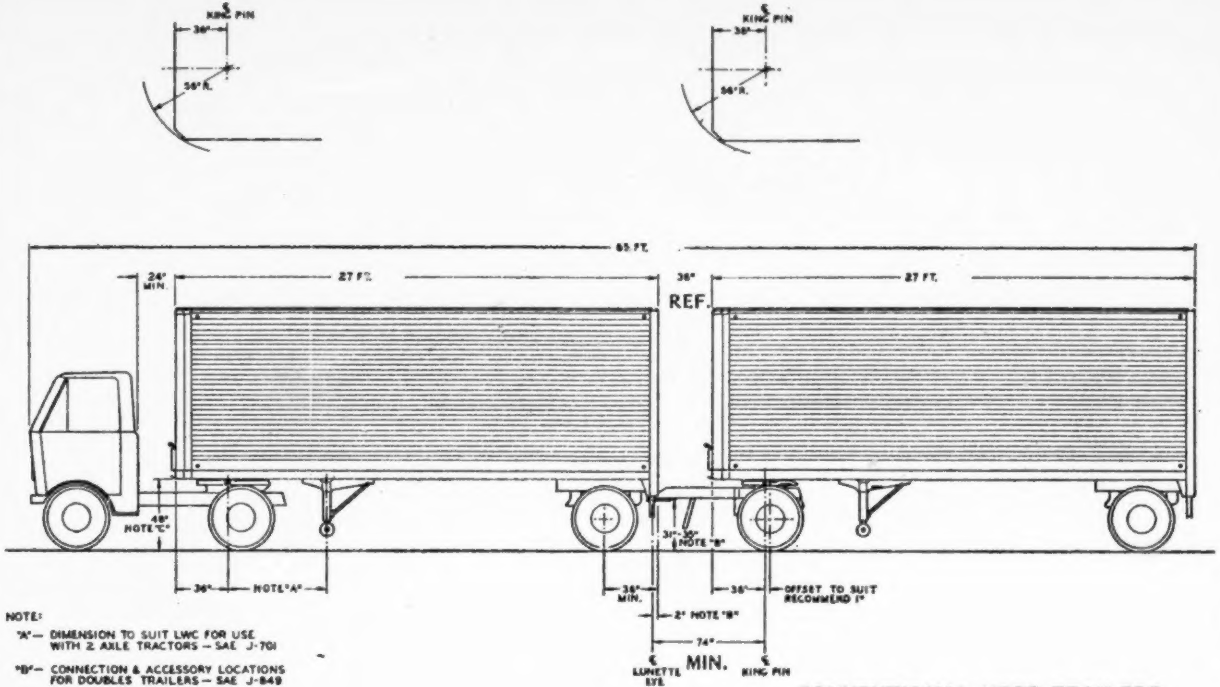
3. Enter a judgment awarding to Plaintiff from Defendants and Defendant-Intervenors the reasonable attorneys' fees, costs and interests in this action.

Dated this 22nd day of November, 1978.

/s/ John H. Lederer
JOHN H. LEDERER
DEWITT, MCANDREWS &
PORTER, S.C.
121 South Pinckney Street
P. O. Box 2509
Madison, Wisconsin 53701
(608) 255-8891

/s/ Terry C. Hancock
TERRY C. HANCOCK
BRADSHAW, FOWLER, PROCTOR
& FAIRGRAVE
11th Floor, Des Moines Building
Des Moines, Iowa 50309
(515) 243-4191
Attorneys for Plaintiff
Consolidated Freightways
Corporation of Delaware

[Certificate of Service Omitted in Printing]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36"
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℄ KING PIN
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56" R.
65 FT.
24" MIN.
27 FT.
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REF.
27 FT.
48" NOTE "C"
36"
NOTE "A"
31"–36" NOTE "B"
36" MIN.
2" NOTE "B"
74"
℄ LUNETTE EYE
MIN.
℄ KING PIN
36"
OFFSET TO SUIT RECOMMEND 1"

NOTE:

"A"— DIMENSION TO SUIT LWC FOR USE WITH 2 AXLE TRACTORS — SAE J-701

"B"— CONNECTION & ACCESSORY LOCATIONS FOR DOUBLES TRAILERS — SAE J-849

"C"— REFER TO SAE J-701 FOR APPLICABLE 5TH WHEEL HEIGHT DEFINITIONS

"D"— EACH TRAILER SHOULD BE EQUIPPED TO SERVE AS THE TOWING TRAILER

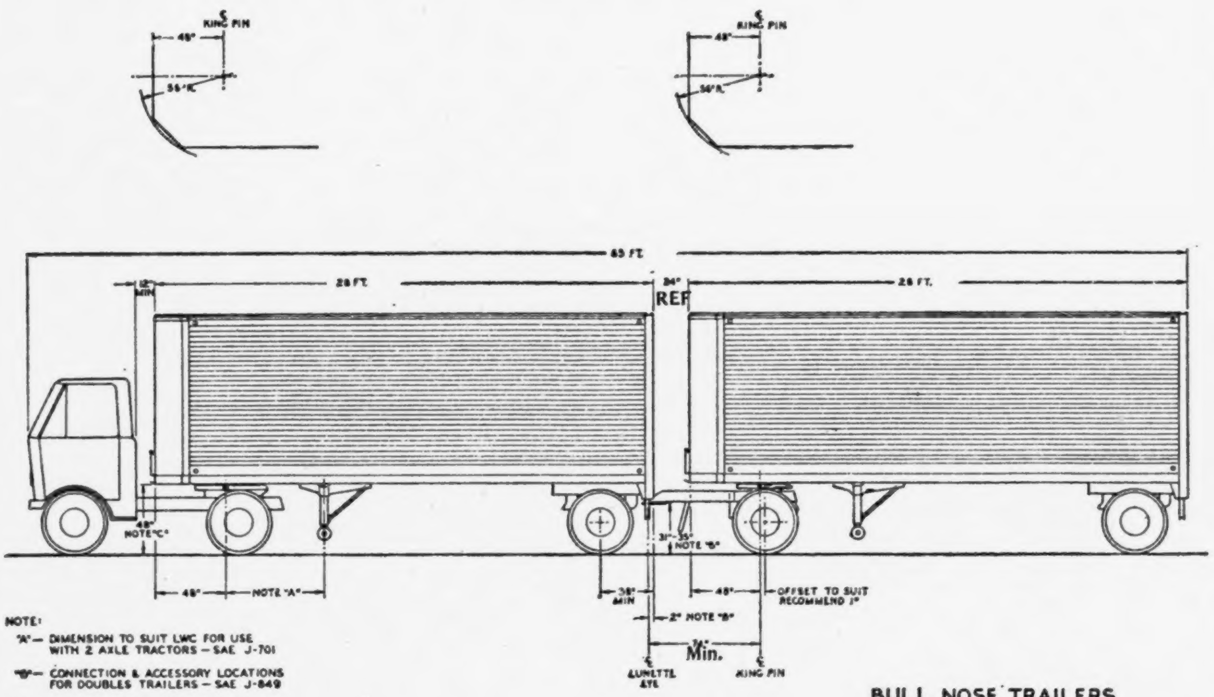
CONVENTIONAL NOSE TRAILERS

TTMA RECOMMENDED PRACTICE

DOUBLES TRAILER COUPLED DIMENSIONS

SHEET 1 OF 2

4/5/77 DOUBLES TRAILER DIMENSIONS FOR INTERCHANGE RP No. 15–77


℄ KING PIN
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56" R.
℄ KING PIN
48"
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65 FT.
12" MIN
28 FT.
34" REF
28 FT.
48" NOTE "C"
48"
NOTE "A"
31"–35" NOTE "B"
38" MIN
2" NOTE "B"
48"
OFFSET TO SUIT RECOMMEND 1"
74" Min.
℄ LUNETTE EYE
℄ KING PIN

NOTE:

"A"— DIMENSION TO SUIT LWC FOR USE WITH 2 AXLE TRACTORS – SAE J-701

"B"— CONNECTION & ACCESSORY LOCATIONS FOR DOUBLES TRAILERS – SAE J-849

"C"— REFER TO SAE J-701 FOR APPLICABLE 5TH WHEEL HEIGHT DEFINITIONS

"D" EACH TRAILER SHOULD BE EQUIPPED TO SERVE AS THE TOWING TRAILER

BULL NOSE TRAILERS

TTMA RECOMMENDED PRACTICE

DOUBLES TRAILER COUPLED DIMENSIONS

SHEET 2 OF 2

ANSWER OF DEFENDANTS, RAYMOND KASSEL, ET AL., TO PLAINTIFF'S AMENDED COMPLAINT

Filed February 2, 1979

[Caption Omitted in Printing]

COMES NOW, Defendants, and in answer state as follows:

I. JURISDICTION

1. The allegations contained in I, paragraph 1 of the Plaintiff's Amended Petition are denied.

2. The allegations contained in I, paragraph 2, of Plaintiff's Amended Petition are admitted.

3. The allegations contained in I, paragraphs 3 and 4 of Plaintiff's Amended Petition are admitted.

4. The allegations contained in I, paragraph 5 of Plaintiff's Amended Petition are denied. The Commissioner replacing Mr. Schoelman is Bruce Van Druff whose address is 806 Prospect Street, Red Oak, Iowa 51566.

5. The allegations contained in I, paragraphs 6 through 10 of Plaintiff's Amended Petition are admitted.

6. The allegations contained in I, paragraph 11 of Plaintiff's Amended Petition are denied. Jon McCoy is no longer the Director of the Motor Vehicle Division, State of Iowa. The position is currently vacant.

7. The allegations contained in I, paragraphs 12 and 13 of Plaintiff's Amended Petition are admitted.

8. The allegations contained in I, paragraph 14 of Plaintiff's Amended Petition are denied in that Thomas J. Miller who resides at the State Capitol Building, First Floor, Des Moines, Iowa 50309, is now the duly elected Attorney General, State of Iowa.

9. The allegations contained in I, paragraphs 15 and 16 of Plaintiff's Amended Petition are admitted.

10. The allegations contained in I, paragraphs 17 and 18 of Plaintiff's Amended Petition are denied.

II. FIRST CAUSE OF ACTION

1. The allegations contained in II, paragraph 19 of Plaintiff's Amended Petition are admitted.

2. The allegations contained in II, paragraph 20 of Plaintiff's Amended Petition are denied.

3. The allegations contained in II, paragraph 21 of Plaintiff's Amended Petition are denied. It is admitted that Interstate 80 runs through Iowa from Davenport, Iowa to Council Bluffs, Iowa.

4. The allegations contained in II, paragraphs 22, 23, 24, 25, 26, and 27 of Plaintiff's Amended Petition are admitted.

5. The allegations contained in II, paragraph 28 of Plaintiff's Amended Petition specifically Exhibits set out in subparagraphs (c) and (d) are denied for lack of sufficient information. Exhibits set out in subparagraphs (a) and (b) are admitted.

6. The allegations contained in II, paragraphs 29 and 30, of Plaintiff's Amended Petition are denied.

7. The allegations contained in II, paragraph 31 of Plaintiff's Amended Petition are denied. It is admitted that:

Section 321.457(6), Code of Iowa, 1977, reads:

> "No combination of three (3) vehicles coupled together, one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers in excess of sixty feet."

8. The allegations contained in II, paragraph 32 and subparts 1, 2, and 3 of Plaintiff's Amended Petition are denied.

9. The allegations contained in II, paragraphs 33, 34, 35, 36, 37 and 38 are denied.

III. SECOND CAUSE OF ACTION

1. Defendants reanswer paragraphs 1 through 38 as set out in III, paragraph 39 of Plaintiff's Amended Petition.

2. The allegations contained in III, paragraph 40, of Plaintiff's Amended Petition are denied.

IV. THIRD CAUSE OF ACTION

1. Defendants reanswer paragraphs 1 through 40 as set out in IV, paragraph 41, of Plaintiff's Amended Petition.

2. The allegations of IV, paragraph 42 and 43, of Plaintiff's Amended Petition are denied.

V.

WHEREFORE, Defendants, on each the alleged causes of action, request that this Honorable Court:

1. Deny the Plaintiff any relief requested

2. Dismiss Plaintiff's Amended Petition, assessing costs and fees of this action to Plaintiff.

IOWA DEPARTMENT OF
TRANSPORTATION

THOMAS J. MILLER
Attorney General of Iowa

ROBERT W. GOODWIN
Special Assistant Attorney General
and General Counsel to
Department of Transportation

By /s/ Lester A. Paff
LESTER A. PAFF
Assistant Attorney General
Department of Transportation
Ames, Iowa 50010
1-515-296-1636

Copies to:

Richard Bittner
600 Union Arcade Bldg.
Davenport, Iowa 52801

Terry Hancock
Bradshaw, Fowler, Proctor
and Fairgrave
11th Floor Des Moines Bldg.
Des Moines, Iowa 50309

John Varda
DeWitt, McAndrews & Porter
121 South Pickney Street
Madison, Wisconsin 53703

[Proof of Service Omitted in Printing]

DEFENDANT-INTERVENOR MOTOR CLUB OF IOWA'S ANSWER TO PLAINTIFF'S AMENDED COMPLAINT

Filed May 29, 1979

[Caption Omitted in Printing]

COMES NOW the Defendant-Intervenor, Motor Club of Iowa and for answer to Plaintiff's Amended Complaint states:

1. Defendant-Intervenor admits that 28 USC § 1331, 28 USC § 1332 and 28 USC § 1343 are federal jurisdictional statutes. Defendant-Intervenor denies that 28 USC § 1983 and 28 USC §§ 2201-2202 are federal jurisdictional statutes. Defendant-Intervenor denies that these statutes confer jurisdiction in this matter.

2-4. Defendant-Intervenor admits each and every allegation of paragraphs 2, 3 and 4 of the Amended Complaint.

5. Defendant-Intervenor denies each and every allegation of paragraph 5 of the Amended Complaint. Mr. Schoelerman has been replaced on the Iowa Transportation Commission by Bruce VanDruff whose address is 806 Prospect Street, Red Oak, Iowa 51566.

6-10. Defendant-Intervenor admits paragraphs 6, 7, 8, 9, and 10 of Plaintiff's Amended Complaint.

11. Defendant-Intervenor denies each and every allegation of paragraph 11 of Plaintiff's Amended Complaint. John McCoy is on longer the director of the Motor Vehicle Division, State of Iowa. This position is currently vacant.

12-13. Defendant-Intervenor admits each and every allegation of paragraphs 12 and 13 of Plaintiff's Amended Complaint.

14. Defendant denies each and every allegation of paragraph 14 of Plaintiff's Amended Complaint. Thomas J. Miller is currently the Attorney General of the State of Iowa.

15-16. Defendant-Intervenor admits each and every allegation of paragraphs 15 and 16 of Plaintiff's Amended Complaint.

17-18. Defendant-Intervenor denies each and every allegation of paragraphs 17 and 18 of Plaintiff's Amended Complaint.

II. FIRST CAUSE OF ACTION

19. Defendant-Intervenor admits each and every allegation of paragraph 19 of Plaintiff's Amended Complaint.

20. Defendant-Intervenor admits that pursuant to its operating authority, Plaintiff routinely transports general commodities among customers located in 46 states and Canada. Defendant-Intervenor admits that Plaintiff transports general commodities through Iowa and transports general commodities between customers served by its terminals located in Cedar Rapids, Iowa and Des Moines, Iowa, and other points in its system, and in interline service. Defendant-Intervenor denies each and every other allegation of paragraph 20 of Plaintiff's Amended Complaint.

21. Defendant-Intervenor admits that Interstate 80 is an east-west transcontinental highway in the United States and, further, that Interstate 80 runs through Iowa from Davenport to Council Bluffs, but denies each and every other allegation contained in paragraph 21 of Plaintiff's Amended Complaint.

22-27. Defendant-Intervenor admits paragraphs 22-27 of Plaintiff's Amended Complaint.

28. Defendant-Intervenor in answer to paragraph 28 of Plaintiff's Amended Complaint states:

(a) Defendant-Intervenor admits that Exhibit A is a map showing the national Interstate Highway System.

(b) Defendant-Intervenor admits that Exhibit B is a map showing the portion of the National Interstate Highway System in Iowa.

(c) Defendant-Intervenor admits that Exhibit C is a map showing the routing to Plaintiff Consolidated Freightways' terminal in Cedar Rapids.

(d) Defendant-Intervenor admits that Exhibit D is a map showing the routing to Plaintiff Consolidated Freightways' terminal in Cedar Rapids.

29-30. Defendant-Intervenor denies each and every allegation contained in paragraph 29 and 30 of Plaintiff's Amended Complaint.

31. Defendant-Intervenor admits the existence of Iowa Code § 321.457(6), but denies each and every allegation contained in paragraph 31 of Plaintiff's Amended Complaint.

32. Defendant-Intervenor in answer to paragraph 32 states:

(1) Defendant-Intervenor denies each and every allegation of subparagraph 32(1) of Plaintiff's Amended Complaint.

(2) Defendant-Intervenor denies each and every allegation of subparagraph 32(2) of Plaintiff's Amended Complaint.

(3) Defendant-Intervenor denies each and every allegation of subparagraph 32(3) of Plaintiff's Amended Complaint.

33-38. Defendant-Intervenor denies each and every allegation contained in paragraphs 33, 34, 35, 36, 37 and 38 of Plaintiff's Amended Complaint.

III. SECOND CAUSE OF ACTION

39. Defendant-Intervenor answers paragraph 39 by incorporating herein by reference its answers to paragraphs 1-38 of Plaintiff's Amended Complaint.

40. Defendant-Intervenor denies each and every allegation of paragraph 40 of Plaintiff's Amended Complaint.

IV. THIRD CAUSE OF ACTION

41. Defendant-Intervenor answers paragraph 41 of Plaintiff's Amended Complaint by incorporating herein by reference its answers to paragraphs 1-40 of Plaintiff's Amended Complaint.

42. Defendant-Intervenor denies each and every allegation of paragraph 42 of Plaintiff's Amended Complaint.

43. Defendant-Intervenor denies each and every allegation of paragraph 43 of Plaintiff's Amended Complaint.

V. RELIEF REQUESTED

WHEREFORE, Defendant-Intervenor prays that all the claims for relief asserted by Plaintiff be dismissed and that the costs of this action be taxed to Plaintiff.

By: /s/ R. Richard Bittner
R. RICHARD BITTNER

By: /s/ Robert D. Lambert
ROBERT D. LAMBERT
Attorneys for Defendant-Intervenor, Motor Club of Iowa

Of Counsel:

BETTY, NEUMAN, MCMAHON,
HELLSTROM & BITTNER
600 Union Arcade Building
Davenport, Iowa 52801
Telephone: (319) 326-4491

DEPOSITION OF KENNETH L. PIERSON

Filed August 17, 1978

[Caption Omitted in Printing]

* * * *

[3] EXAMINATION BY COUNSEL FOR THE PLAINTIFF

BY MR. AXELROD:

Q Mr. Pierson, will you state your full name, title and business address.

A Yes. My name is Kenneth Lantz Pierson. L-a-n-t-z. P-i-e-r-s-o-n. I am Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration, Department of Transportation, Washington, D.C. 20590.

Q What is the Bureau of Motor Carrier Safety, Mr. Pierson?

A The Bureau of Motor Carrier Safety is a regulatory and [4] enforcement agency that regulates the safety of operations of trucks and busses engaged in interstate or foreign commerce.

* * * *

[7] Q How prevalent are 65-foot twin trailers among motor carriers in interstate commerce

A The majority of the states allow 65-foot twin trailers, combinations.

[8] Q Is the 65-foot twin trailer an industry standard with respect to any commodity?

A Yes. It's used generally by general commodity carriers.

Q How prevalent are 60-foot twin trailers today?

A They are a rarity. To my knowledge, used only in one state.

Q What state is that?

A Iowa.

Q Why are 60-foot twin trailers an oddity?

A Well, they are captured in that state because they cannot be interchanged economically with other fleet vehicles in bordering states.

Q Could you tell us when 65-foot twin trailers were first used in interstate commerce?

* * * *

A I am not sure about the overall dimensions, but there are reports of twin trailers being used as early as 1917. However, they came into general use following World War II, beginning with the development of the interstate highway system, around [9] 1955.

Q Are 65-foot twin trailers permissible under the Federal Motor Carrier Safety Regulations?

A Yes, they are.

Q Can 65-foot twin trailers meet all the standards in the Federal Motor Carrier Safety Regulations, including but not limited to the standards with respect to braking and stopping distances?

A Yes, they can.

* * * *

[10] Q What has the safety experience of the Bureau of Motor Carrier Safety been with respect to 65-foot twin trailers as opposed to tractor semitrailer combinations of 55-foot?

A According to the data available to the Bureau, 65-foot twin combinations are as safe as, if not safer than, the standard tractor semitrailer configuration.

Q Do you have any data supporting your statement that twin trailers are safer or as safe as 55-foot semitrailers?

A Yes. The Bureau issued last fall a report of the summary of eight years of data from fleets who have operated both singles and doubles in the states where they are authorized.

* * * *

[12] Q Would you summarize the rates for the eight-year period, Mr. Pierson?

* * * *

[13] A Yes. This tabulation shows that the doubles rates were lower in terms of accidents, injuries, fatalities and property damage over that of single units.

* * * *

[14] Q What general conclusions, if any, are you able to make as a result of Exhibits 2 and 3 with respect to the relative safety of 65-foot twin trailers when compared to tractor semitrailers?

A This data and other data convinces us that doubles are as safe as, if not safer than, singles.

Q Does the data in the Department survey, which is in Pierson Exhibits 2 and 3, conform to your own qualitative experience as the chief enforcer of the Federal Motor Carrier Safety Regulations?

A Yes, it does.

Q As the deputy director of the Bureau of Motor Carrier Safety do you have any objections in terms of safety to 65-foot twin trailers?

A No, I do not.

[15] Q Why are 65-foot twin trailers as safe or safer than 55-foot tractor semitrailer combinations?

A Well, there are a number of considerations. First, doubles track better because they have more turning points; doubles have better braking capability because there are more axles and therefore more tire footprint; doubles maneuver easy in traffic and doubles have a better turning radius and therefore less off-tracking.

Q What is off-tracking?

A Off-tracking is the ability of the towed units to follow in the path of the power unit.

Q How is off-tracking a significant factor, if it is a significant factor, in terms of safety?

A It is significant because of the avoidance of running tires over curbs or having the tires go off the pavement on cloverleafs and otherwise avoiding objects which the driver is steering around.

* * * *

[16] Q Can you compare the propensity to jackknife of 65-foot twin trailers to 55-foot tractor semitrailers?

A Yes. The singles units, or even doubles units of the lower dimensions, tend to jackknife before the longer units because the jackknifing is a question of brake imbalance or power imbalance, and the more units the less likelihood of them off-tracking or being out of balance.

* * * *

[17] Q Can you compare the 65-foot twin trailer in terms of passing and passing times with the 60-foot twin trailer and the 55-foot tractor semitrailer?

A The difference in terms of time would be less than one second at free flow traffic speeds.

Q On interstate highways, in your judgment would a fraction of a second be significant in terms of safety?

A No, it wouldn't, because there are dual highway installations with good sight distance and controlled grades.

Q In terms of safety, what is the effect of the state [18] requiring a particular vehicle combination such as 65-foot twin trailers to use a circuitous route around that state at an increase in vehicle miles traveled?

A Well, one of the problems that we foresee with circuitous routing is that it increases the exposure of the vehicle to other traffic; therefore, increases the likelihood of accidents, which will happen ultimately.

* * * *

EXAMINATION BY COUNSEL FOR THE DEFENDANTS

BY MR. PAFF:

* * * *

[35] CROSS EXAMINATION BY MR. PAFF

Q Now, with regard to your study, you call it "Safety Comparison of Doubles Vs. Tractor-Semitrailer Operation"; is that correct?

A Yes.

Q Now, does this study attempt or seek to break down doubles as referred to as 65-foot double-bottom tractor combinations as opposed to 60-foot double-bottoms?

A No, it does not.

Q So that the doubles as referred to in that report would cover all spectrum of vehicles of the configuration that you previously described; is that correct?

A As doubles, yes, that is correct.

Q So this report, this summary of statistics, which has been prepared at your direction, would not articulate those two differences, would they not, on a statistical basis?

[36] A It would not.

Q Now, you described in your definition section, I believe—I am referring now to an unnumbered page in the definition section; Doubles, one truck tractor pulling one semitrailer and one full trailer. Is that correct?

A Yes.

* * * *

Q So there was a letter prepared that went out to the carriers; is that correct?

A That is correct.

Q Now, with regard to that letter, do you know the number of carriers that that letter was sent to?

[37] A Basically those listed as participants, except for the period 1974 through 1976 there was one additional letter.

Q To whom did that go, sir?

A Consolidated Freightways.

* * * *

[38] Q And this data was requested from Consolidated Freightways for the '74 through '76 period; is that correct?

A Yes, it was.

Q And according to your data sources listed on the page they did not respond. Is that correct?

A That's correct. They advised the agency that they had changed computer programs and could not readily produce the information, but would if we wanted to delay the report until they generated it.

Q And have they subsequently produced that information for you?

A No. We advised them that we would simply select another [39] carrier.

* * * *

[40] Q Was there any check made after the data was received back with the carriers to substantiate that information that you had obtained before you included it in that report?

A No, there wasn't.

Q Was there any follow-up letter sent to the carriers with regard to supplying information or—

A Yes. I wrote a letter thanking them for their participation.

* * * *

[44] Q Do you know which type of driver, or was there any control in this particular data with regard to the type of driver and his experience that was reported by the companies?

A We did not pursue that with the companies, although it's, I think, common knowledge that the more senior drivers under the union contracts bid for the higher-paying jobs of driving the doubles as opposed to the singles.

Q In your opinion would those be more experienced drivers with regard to the operation of an articulated vehicle?

A Yes.

Q Also, with regard to the roads upon which these are operated, was there any reporting—anything on the reporting matrix that had the carrier designate upon which particular route these models would travel?

A No, there was not.

Q So within the numbers that are provided here there is no way to distinguish the number of miles operated on dual divided highways or interstate system as opposed to two-lane highways?

A There's not.

Q I think you also mentioned that maintenance was a big [45] component of safety; is that correct?

A Yes, I did.

Q In other words, a well-maintained 55-foot tractor semi may be safer than an ill-maintained 65-foot or 60-foot double bottom, isn't that correct?

A That's correct. Although I would not want to mislead you. The bulk of the accidents, the primary cause is a driver failure.

Q So the bulk of the accidents even reported in this study relate in your opinion to driver failure rather than vehicular failure; is that correct?

A That's correct.

Q Was there any control built into this study to indicate driver failure?

A No, there was not.

Q What percentage of these accidents related to driver failure?

A These specific ones I have no idea.

Q Based upon that assumption, Mr. Pierson, that driver failure accounted for more errors and assuming that it's common knowledge that the more senior drivers operate the double bottom vehicles, is it fair to assume, also, then, that that fact would [46] reflect in the statistics that you have presented?

A Yes.

Q What percentage could you indicate for us would that be?

A My opinion about the levels of causal factors in accidents goes to my review of the general accident data which we developed from the 18,000-plus accident reports filed with the agency; kind of a gross production would be something on the order of 75 percent driver error, perhaps 20 percent vehicle, and perhaps 5 percent roadway and all other causes.

Q Now, with regard to the 75 percent driver error, would that relate to an error made regardless of the type of truck that was being driven whether single or double or triple or whatever?

A Yes, it would.

Q And with regard to the 20 percent, which I didn't mark down what you considered that, sir—

A It would be vehicle defects.

Q Vehicle conditions.

A Vehicle conditions.

Q Does that relate to maintenance by and large?

A Yes, it does. Maintenance and inspection.

[47] Q Then 5 percent roadway conditions and other related causes.

A Yes.

* * * *

Q So I assume that that 5 percent might relate to what you describe as a comparison in this study; is that correct?

A No, I don't think that is correct. What the data shows, [48] in my judgment, is that it's possible to operate doubles at a rate of accident involvement which is lower than singles.

Q But it certainly doesn't show that they are any safer when you take into the consideration the operational aspects that you have just testified to, does it?

A I don't believe I agree with that. One determines whether—one determines comparative safety by assessment of whether they perform better, and better means less accidents or less fatalities.

* * * *

[49] Q So there is no way to directly ascribe the 86 or the 119 directly to the configuration on the vehicle, is there, without taking into consideration these other particular factors?

A I think I agree with that.

Q So again I will ask my question: There is no way particularly to tell with relation to this data the specific safety aspect of which goes directly to the issue of whether or not it is an articulated vehicle or not, is there?

A No, I don't agree with that statement. What the data shows is that for these carriers that operate in a franchised territory, in the case of the for-hire carriers or a general territory with respect to the private carriers, that they had two different experiences: One rate of accidents with doubles and one rate of accidents with singles.

Q I follow your thinking to that point, but then you further testified that making up that safety experience are other things related to driver error and so forth that relate to that [50] accident experience, isn't that correct?

A I'm not sure I can compare apples and oranges. One has to do with their performance, the other one has to do with the proximate cause of the accidents.

Q And all these other aspects are reflected in the statistic that you provided or the numbers that you have put down here; is that correct?

A Yes, they are reflected in it.

Q And there is no way then to specifically ascribe that to the type of vehicle which was operated? The single aspect of the double versus the tractor semitrailer combination itself.

A No, I don't agree with that statement. My statement is, and the report's purpose was to show that there were two—that there were different experiences by doubles and by singles by these companies.

* * * *

[54] Q Is there any compilation, and I meant to ask you, in your study regarding the amount or the weight of the vehicle involved in this particular accident statistic?

A No, there isn't.

* * * *

Q But you would concede, would you not, Mr. Pierson, that there are times when a fraction of a second could be critical with regard to avoiding an accident?

A Well, I would suggest if less than a second was the critical tolerance you ought not to have passed in the first place.

* * * *

[70] FURTHER EXAMINATION BY COUNSEL FOR THE PLAINTIFF

BY MR. AXELROD:

Q Is it fair to say that if the projections in Pierson Exhibit 3 are correct, that the maximum utilization of doubles would actually save lives in terms of raw numbers?

A That would be my estimation.

MR. AXELROD: Thank you.

MR. PAFF: Mr. Pierson, with regard to that point, though, isn't that in terms of the number of vehicle miles traveled and not in terms of the number of actual fatalities?

WITNESS: My logic is that there is "X" amount of traffic out [71] there and can move in large number of singles or a lesser number of doubles, and the logic that I follow says that there would be savings if all of the freight moved in the lesser number of vehicles.

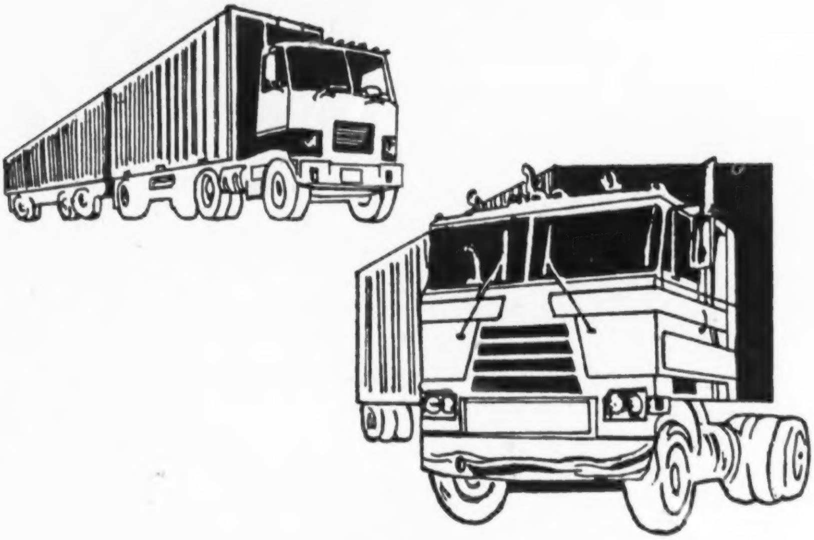
* * * *

JURAT

* * * *

EXHIBIT FILE COPY
DO NOT REMOVE

Safety Comparison of Doubles vs Tractor-Semitrailer Operation



November 1977

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

33

TECHNICAL REPORT

A SAFETY COMPARISON OF DOUBLES VS. TRACTOR-SEMITRAILER OPERATIONS

November 1977

Bureau of Motor Carrier Safety
Federal Highway Administration

Summary

SAFETY COMPARISON OF DOUBLES VS. TRACTOR-SEMITRAILER OPERATIONS

		Number of Vehicles	Number of Miles (000) Operated	Number of Accidents	Number of Injuries	Number of Fatalities	Amount of Property Damage ($)	Accidents/ Mile (000,000)	Injuries/ Mile (000,000)	Fatalities/ Mile (000,000)	Property Damage ($)/ Mile	Injuries/ Accident	Fatalities/ Accident	Property Damage ($)/ Accident
1976	Doubles	1,816	211,641	121	65	14	917,222	.572	.307	.066	.0043	.537	.116	7,580
	Tr-Semi	1,522	143,799	122	87	8	866,239	.848	.605	.056	.0060	.713	.066	7,100
1975	Doubles	1,827	200,644	147	97	6	1,505,290	.733	.483	.030	.0075	.660	.041	10,240
	Tr-Semi	1,437	127,199	90	72	10	734,615	.707	.566	.079	.0058	.800	.111	8,162
1974	Doubles	1,810	220,134	130	109	11	866,446	.590	.495	.050	.0039	.838	.085	6,665
	Tr-Semi	1,419	130,740	115	90	6	740,604	.880	.688	.046	.0057	.783	.052	6,440
1973	Doubles	3,018	461,322	351	227	19	2,184,691	.761	.492	.041	.0047	.646	.054	6,224
	Tr-Semi	2,145	193,552	182	140	15	1,274,416	.940	.723	.078	.0066	.769	.082	7,002
1972	Doubles	2,899	434,580	287	239	21	1,512,333	.660	.550	.048	.0035	.833	.073	5,269
	Tr-Semi	2,283	198,646	158	148	16	824,359	.795	.745	.081	.0041	.937	.101	5,217
1971	Doubles	2,667	392,062	251	217	19	1,653,118	.640	.554	.049	.0042	.865	.076	6,586
	Tr-Semi	2,312	202,135	156	142	10	1,004,991	.768	.699	.049	.0050	.910	.064	6,442
1970	Doubles	2,588	337,911	211	180	21	1,260,067	.624	.533	.062	.0037	.853	.100	5,972
	Tr-Semi	2,332	184,872	178	171	13	958,568	.963	.925	.070	.0052	.961	.073	5,385
1969	Doubles	1,721	204,075	108	101	8	453,685	.529	.495	.039	.0022	.935	.074	4,201
	Tr-Semi	1,651	124,329	105	124	8	485,494	.845	.997	.064	.0039	1.18	.076	4,624

* * * *

Data Sources

For 1969 through 1973, data represents:

IML Freight, Inc.
Pacific Intermountain Express Company
Pacific Motor Trucking Company
Boise Cascade Corporation
Garrett Freightlines, Inc.
Navajo Freight Lines, Inc.
Consolidated Freightways

For 1974 through 1976, data represents:

IML Freight, Inc.
Pacific Intermountain Express Company
Pacific Motor Trucking Company
Boise Cascade Corporation
Garrett Freightlines, Inc.
Navajo Freight Lines, Inc.
Georgia-Pacific Corporation

* * * *

EXHIBIT No. 3

1969-1976

SAFETY COMPARISON OF DOUBLES VS. TRACTOR-SEMITRAILER OPERATIONS

	Number of Vehicles	Number of Miles (000) Operated	Number of Accidents	Number of Injuries	Number of Fatalities	Amount of Property Damage ($)	Accidents/ Mile (000,000)	Injuries/ Mile (000,000)	Fatalities/ Mile (000,000)	Property Damage ($)/ Mile	Injuries/ Accident	Fatalities/ Accident	Property Damage ($)/ Accident
Doubles Total	18,346	2,462,369	1,606	1,235	119	10,352,852	.652	.502	.048	.0042	.769	.074	6,446
Tr-Semi	15,101	1,305,272	1,106	974	86	6,889,286	.857	.746	.066	.0053	.881	.078	6,229

PLAINTIFF'S EXHIBIT NO. 23

[EMBLEM]

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Bureau of Motor Carrier Safety
Washington, D.C. 20590

May 3, 1979

In Reply Refer to:
HMC-21

Anthony R. Varda, Esq.
DeWitt, McAndrews & Sundby, S.C.
121 South Pinckney Street
Madison, Wisconsin 53703

Dear Mr. Varda:

This replies to your letter of April 13 to Mr. Donnell W. Morrison requesting supplemental information to the 1977 report entitled, "Safety Comparison of Doubles Vs. Tractor-Semitrailer Operations."

After careful consideration, we have decided to partially grant and partially deny your request. The three items you seek will be discussed in the order they are presented in your letter:

1. Copies of the actual letters soliciting data in both 1974 and 1977 would serve no purpose, since all were identical form letters. We are enclosing copies of the 1974 and 1977 form letters.
2. The 1977 report reflects virtually the entire contents of each response from participating motor carriers. Hence, we see no point in forwarding copies of the actual responses. Several motor carriers merely sent back the form without a cover letter.

We question the propriety of identifying those motor carriers who were sent requests but did not participate, since there is an easy-to-draw implication that these motor carriers have something to hide. It is our best judgement that there is no validity to this implication; rather, the recordkeeping systems of the carriers involved did not permit extracting the requested data without unreasonable manual effort. A total of three motor carriers fell into this category during the two reporting periods.

3. The motor carriers represented for each of the two reporting periods are identified as follows:

1974-1976

A—Georgia-Pacific Corporation
B—Pacific Intermountain Express Company
C—Navajo Freight Lines, Inc.
D—IML Freight, Inc.
E—Pacific Motor Trucking Company
F—Boise Cascade Corporation
G—Garrett Freightlines, Inc.

1969-1973

A—Navajo Freight Lines, Inc.
B—Boise Cascade Corporation
C—Pacific Motor Trucking Company
D—Pacific Intermountain Express Company
E—Consolidated Freightways
F—IML Freight, Inc.
G—Garrett Freightlines, Inc.

We trust the foregoing responds adequately to your needs.

Sincerely yours,

/s/ Kenneth L. Pierson
KENNETH L. PIERSON
Deputy Director

2 Enclosures

DEPOSITION OF ERNEST G. COX

Filed September 28, 1978

[Caption Omitted in Printing]

* * * *

[4] EXAMINATION BY COUNSEL FOR PLAINTIFF

BY MR. AXELROD:

* * * *

Q What is your occupation, Mr. Cox?

A Actually I'm retired. I do serve as consultant in a limited number of cases where in my opinion a useful public service purpose is to be served. I retired in 1969 from [5] government service and following that served as a full-time consultant to American Trucking Association in the field of commercial vehicle safety and retired from that position in February 1976.

* * * *

[7] Q Mr. Cox, could you describe precisely what your duties were, both as Deputy Director of Bureau of Motor Carrier Safety, both in the Department of Transportation and earlier when that bureau was in the Interstate Commerce Commission?

A As chief of the section of safety—this, of course, was during that period of time beginning in December of 1951—it was my responsibility to serve as a senior adviser to the Interstate Commerce Commission with respect to the formulation and adoption of regulations relating to commercial vehicles, commercial vehicle operations in interstate and foreign commerce, [8] pursuant to requirements of Section 204 of the Interstate Commerce Act and Section 304 of the U.S. Code. These regulations were basic and very comprehensive, relating to qualifications and also the maximum hours of service permitted for motor carrier employees in both truck and bus operations, regulations requiring certain procedures in vehicle operations, regulations relating to the parts and accessories of vehicles, brakes, lighting systems, coupling devices, tires, suspensions of vehicles operating in interstate commerce, and particularly requirements that were essentially necessary in the transportation of explosives and other dangerous articles under the provisions of the Transportation Explosives Act, which at that time was provided in Title 18 of the U.S. Code, Sections 831 through 835.

My duties also included direction of field staff employees in the special investigation of accidents of substantial consequence, the development of reports to be published setting forth the facts of those accidents and the recommendations to be made by the Commission relative to measures to prevent recurrences.

* * * *

[9] Q Mr. Cox, who holds the position presently that you retired from at the Bureau of Motor Carrier Safety?

A Kenneth Pierson. It's Spelled P-i-e-r-s-o-n.

Q Mr. Cox, are you familiar with a combination of truck vehicles known as 65 foot twin trailers?

A Yes.

Q Are you familiar with a combination of vehicles of approximately 55 feet, commonly known as tractor semitrailers?

A Yes.

Q And are you familiar with 60 foot twin trailers?

A Yes.

* * * *

[10] Q During your tenure as Deputy Director of the Bureau of Motor Carrier Safety, were twin trailers permitted to carry explosives?

A No. For many years the transportation of explosives was prohibited in a combination of vehicles that included two trailers up until such time as the regulation was changed.

Q When did that change occur?

A 1961.

* * * *

[12] Q Do you know the origin of the provision in Exhibit 2 that prohibited the transportation of explosives on twin trailers?

A No. That provision was adopted a number of years prior to my association with the Interstate Commerce Commission.

* * * *

[13] Q Was it within the power of the Interstate Commerce Commission to change this rule without the necessity of the filing of a formal petition?

A Yes, it was, and, in fact, a very common practice for the Commission to either initiate new regulations or change existing ones on the recommendation of its staff, including me, wherever this seemed to be a suitable course of action.

Q So you had the power to initiate a change in the regulation to permit explosives on twin trailers even absent [14] this petition?

A Yes. And, in fact, for a very considerable period of time, I have been importuned by a number of motor carriers to take the action which the petition sought.

Q Did you do so?

A No. I resisted the efforts consistently for a considerable period of time for the reason that I was not satisfied that in those states where relatively short full trailers were permitted to be attached to a semitrailer drawn by a power unit, that the use of such short trailers was consistent with the standard of safety which was essential in the transportation of explosives. I had for a long period of time been aware of substantial evidence of instability and of mishappenings, accidents, involving the operation of these short semitrailers—those operated in the state of Michigan were known as pups—and experience on my part and knowledge of the experience of the motor carriers in whose service they were operating convinced me that the safety responsibilities of the Commission could not be satisfactorily met by the operation of such vehicles in the transportation of dangerous goods.

Q After the petition was filed, what, if anything, were you directed by the Commission to do with the petition?

[15] A I was not specifically directed by the Commission to take any particular action, but it was a normal part of my responsibilities to deal with the filing of such a petition as this just automatically. It was my responsibility to analyze it, to study the arguments in support of the action that the petition sought, to reconcile the proposed action with what our previous experience had been, to study as thoroughly as possible from whatever source what the likely safety results of such an action would be.

* * * *

[17] Q What about the stability of 65 foot twin trailers in particular?

A The stability, always assuming that the wheelbase provision that I have already referred to [at least 184 inches] is observed as a minimum—and that, of course, is possible in combinations of 65 feet—the safety performance in my opinion is highly [18] satisfactory. It's excellent.

Q What was your recommendation to the Commission?

A I recommended the change in regulation be made subject to the provision of the minimum length of wheelbase at 184 inches.

Q Was this change permitting twin trailers to carry explosives made by the Commission?

A Yes.

Q When was it made, Mr. Cox?

A In 1961.

[20] Q Where does it appear in that exhibit, Mr. Cox?

A In Exhibit 5, this provision appears in Title 49, CFR Section 177.835(c)(2).

Q Would you bracket that, Mr. Cox?

A (Witness complied.)

Q Can you tell us whether or not that would be substantially similar to the regulation that's been marked as Cox Exhibit 4?

A Yes. With respect to this particular restriction, they are identical.

Q What is the significance of requiring a wheelbase of at least 184 inches on each of the trailers?

A It's critically important to be as sure as one can be, within the conditions of the real world necessitating the transportation of any kind of goods, that whatever reasonable provision can be made to assure the stability in the operation of combination vehicles be taken. Now, the longer a trailer is, which is drawn by another trailer attached to a power unit, the greater is the likelihood that this trailer will track properly, not cross the center line of a roadway or get off of the payment edge to its right, the likelihood is substantially lessened that it will be overturned. In every respect the safety performance is enhanced. There are other aspects to

* * * *

[21] Q Now, back in 1961, how long a vehicle combination are we talking about when we talk about two trailers having a wheelbase of at least 184 inches?

A Well, certainly during the late 1940's and the early 1950's, 60 feet combinations were permitted in the Western states. However, as time went on and a year subsequent to 1954, the use of 27-foot semitrailers rather than 24-foot semitrailers, full trailers, became much more common in the Western states, and it was because of this general trend and change in overall length that made it practical and possible for this regulation to be changed where this stipulation of minimum wheelbase length became possible.

Q And in 1961, how long were these units that had the [22] 184-inch wheelbase in total, taking the two boxes and the dolly and the tractor?

A 65 feet in most states where such trailers were permitted.

Q Since the change in the rule in 1961, have explosives in fact been safely carried on twin trailers?

A Yes, indeed. The experience has been remarkably good over the years, and so far as my recollection is concerned, in those cases in which an explosives mishap has occurred, the configuration of the vehicle combination has not been a contributing cause.

Q From 1961 until your retirement in 1969, what was the safety experience of the Bureau Motor Carrier Safety with respect to twin trailers as opposed to tractor semitrailers?

A The experience was very satisfactory and superior over the course of a number of years. It was very satisfactory.

Q In terms of safety, Mr. Cox, do you have an opinion as to the affect of Iowa requiring 65-foot twin trailers to use circuitous routes around the states from Missouri and Kansas at an increase in mileage?

A Yes. Speaking now from a safety standpoint as contrasted with whatever economic values are involved, but purely [23] from a safety standpoint, any requirement that results in a greater mileage or the use of more vehicles than necessary to perform a particular quantity of transportation inevitably increases the exposure to mishap, to accident. Whenever you operate a vehicle a greater distance than would otherwise be necessary or whenever you operate more vehicles than would otherwise be necessary to perform a particular measure of transportation, you unavoidably have increased the risk of mishap.

Q That was my next question. In terms of safety, what affect does the required use of 60 foot twin trailers have in lieu of 65 foot twin trailers?

A Am I to consider, in response to this question, the condition you mentioned in the earlier question with respect to avoidance of a particular state?

Q Well, I guess the question I am asking you, if you require 60 foot twin trailers in lieu of 65 foot twin trailers, what affect on safety will this have?

A Well, wherever it happens, it would tend to increase the operational requirements, add to the number of vehicles operated or the distance operated, and, therefore, would be disadvantageous from a safety standpoint.

[24] Q Now, do you have an opinion today, Mr. Cox, as to the relative safety of 65 foot twin trailers when compared to the relative safety of 55 foot tractor semitrailers?

A Oh, yes.

Q What is that opinion?

A My opinion is [that it is] decidely superior from a safety standpoint to have goods transported in a combination of two trailers with a 65 foot limitation than in a single trailer such as is possible with a 55 foot limitation.

Q Do you have an opinion today as to the relative safety of 65 foot twin trailers as compared with 60 foot twin trailers?

A Yes. My opinion is that with the increased length possible under a 65 foot combination, you certainly have a greater measure of stability and safety than with the shorter length.

* * * *

EXAMINATION BY COUNSEL FOR DEFENDANTS

BY MR. PAFF:

* * * *

[27] Q How soon after you left government employ did you go into this consultant retainer relationship with American Trucking Association?

A I retired from government service on June 30, 1969, I began my association with American Trucking Associations on September 22 of the same year.

Q Do you have an approximation of your income as paid to you by the American Trucking Association between September 22 of '69 and September 22 of 1970.

A Yes.

MR. AXELROD: You want it on an annual basis?

BY MR. PAFF:

Q Just roughly on an annual basis.

A I began this work at $15,000 a year, it was increased to 17,500 prior to my departure.

Q And you were called in basically to study particular problems in which your expertise might be required, is that correct?

A I think it requires a little more explanation than that.

Q Okay. Fine.

[28] A American Trucking Association in its undertaking to improve the overall safety performance of motor carriers had long had a safety department. Many of the state associations also carried on varying types of safety activities. In an effort to find means of improving the overall safety performance, both nationally and statewide, the American Trucking Association established an executive level policy committee in 1967, which it called Safety Committee on Review and Evaluation. The purpose of that committee was to bring the interest of motor carrier executives consistently into support of improved safety undertakings.

After my departure from government, it was suggested to me that I might usefully further that purpose by becoming the coordinator of that safety committee. Later, because of the interest of the Association in environmental matters, as well as safety performance, the scope of the Committee's interest was broadened and its name was changed to Safety Committee on Research and Environment, so my purpose was to, in effect, carry out the same objectives that I had while I was in government service by acting through the Association's facilities.

* * * *

[44] Q But the basis of that study and the observations was based on a mix that included the operation of 60 foot doubles?

[45] A In the early years, I would say prior to approximately 1954, 60 foot doubles were commonly used. But in the late 1950's, the trend was toward longer combinations using 27-foot trailers which was possible only under a 65-foot limitation, but as the years went on, this trend continued and it was especially widespread in the Western states.

Q But in 1961 when that regulation was changed, the common experience was with something less than the 60 foot double combination, was it not?

A No. On the contrary. The bulk of the experience was with operations of doubles exceeding 60 feet.

* * * *

[48] Q Now, would that [stability] vary from, in your experience, based upon what you have testified to, between a 60 foot double combination and a 65 foot double combination?

A Generally, yes.

Q And upon what do you make that conclusion, sir? Your personal observation?

A My personal judgment of which I am aware of the fact [48] that the shorter a vehicle in a combination of this type is the more likely it is to be subject to instability.

* * * *

Q I believe you also testified that with regard to a situation where you would route a truck a more circuitous route, the chances of having an accident would go up, is that correct?

A Yes, sir.

Q And that same principle would apply whether those two points were within one state or within several states, would it not?

A Correct.

Q And it's a question of where the road goes, so to speak, when we are dealing with a truck and not necessarily where trucks have to go, is it not?

A Well, the testimony to which you are now referring related to the fact that in such states as have what I would call restrictive requirements lengthwise, there is inevitably the necessity for major motor carriers to find alternative [50] routes. When that occurs, it results in a substantially increased exposure to accidents. The very fact that you operate x number of miles above what is normally necessary, it creates an inevitable accident risk that would not otherwise occur.

Q And the same logic would apply, would it not, when you have an increased number of trucks on the road?

A Yes, it would.

Q In other words, if I operate two trucks instead of one, my chances of having an accident would increase?

A Of course.

* * * *

JURAT

* * * *

DEPOSITION OF EDWARD E. KYNASTON

Filed May 18, 1979

[Caption Omitted in Printing]

[4] EXAMINATION BY MR. AXELROD

BY MR. AXELROD:

Q Would you state your name for the record, Chief Kynaston?

A Edward E. Kynaston.

Q And what is your business occupation, sir?

A I am a Deputy Chief Commander of the California Highway Patrol Enforcement Services Division.

* * * *

[5] Q What responsibilities do you have in your present position with respect to commercial vehicles specifically?

A I have on-going responsibility for program management, that is, on a staff level wherein we develop, assist in the budgeting and equipping of the department's field program relating to the safety and inspection of heavy commercial vehicles.

* * * *

[6] Q How long have 65-foot twin-trailers been permitted in California, Chief?

A Since about 1959.

Q Prior to 1959, were shorter twin-trailers permitted in California?

A Yes, I think starting about 1950.

Q How long were the twin-trailers that were permitted in California from 1950 to 1959?

A 60-foot, I believe, is the maximum.

* * * *

[8] A Yes. As traffic officer from 1957 through 1975, I served on a regular beat patrol enforcement duties on Interstate 80.

Q How busy is Interstate 80?

A It is a busy highway. It is probably being the only east-west highway in California north of Los Angeles. It bears a large share of the interstate traffic.

Q Have 65-foot twin-trailers posed any unique problems on Interstate 80, particularly in the Donner Pass area during bad weather?

A No.

* * * *

Q What was the safety experience been in California with respect to 65-foot twin-trailers?

A I believe it is quite comparable to that of other types of heavy commercial combinations.

Q How does the 65-foot twin-trailer compare in terms of safety with the tractor semi-trailer?

A I believe it is very comparable.

Q How has the public reacted to 65-foot twin-trailers in California?

A I don't believe there has been any adverse public reaction. [9] I think there is a public concern about large trucks, and by large trucks, I mean trucks of anything much larger than a passenger car.

Q Have you received any complaints directly aimed at 65-foot twin-trailers?

A No.

Q Would you have any hesitation in recommending 65-foot twin-trailers through officials of other jurisdictions?

A No, I would not.

* * * *

Q Does the extra fraction of a second which it takes to pass a 65-foot vehicle as opposed to a 60-foot vehicle create any problem in terms of safety on four-lane highways in California?

A No.

* * * *

[10] Q Does a 65-foot vehicle offer any safety advantages over a 60-foot vehicle in terms of length alone?

A None that I can think of, unless you think in terms of the total amount of cargo that might be carried. If you can carry more in one combination, the additional five feet theoretically, I presume, that would lessen the total number of combinations that would have to be on the highway to transport the same amount of loads. That is the only thing I can think of.

* * * *

[11] Q Have 65-foot trailers created any unique safety problems in terms of the traffic mix between large vehicles and smaller vehicles such as compact cars?

A No, not to my knowledge.

Q Chief Kynaston, I would like you to assume that a 60-foot twin-trailer and a 65-foot twin-trailer are both similarly equipped with the same required safety equipment, and that the 60-foot vehicle weighs 60,000 pounds and the 65-foot vehicle weighs 65,000 pounds. Do you have an opinion as to the relative safety of operation of these two vehicles?

A Well, assuming that they are operated in the same type of safe manner and with comparable levels of maintenance on the equipment, I would see no difference in the operation.

* * * *

[22] EXAMINATION BY MR. PAFF

* * * *

[29] Q Is the [congestion] problem accentuated by having longer trucks traversing the grade as opposed to a shorter truck traversing that grade?

[30] A No, I don't believe the length would have anything to do with it, because we are full freeway now going over Interstate 80, and I presume what you're talking about is if it were two-lane, there might be a passing problem, and I guess you could talk about the time it takes to pass a longer truck than the shorter, which would probably not be a very significant time. I don't believe that I see that as a problem in our four-lane or even on Highway 50, which is a parallel to Interstate 80 to the south, which is two-lane in some portions, except maybe a very slight difference in the time it takes to pass.

Q You have investigated singular accidents where a fraction of a second could make a difference between an accident occurring and not occurring, haven't you?

A Yes. Virtually every accident there is that moment when vehicles contact that if you can alter that one way or the other, it will make a difference.

Q Same with regard to length—five feet, ten feet. There have been situations in which that may be a critical distance in a specific accident?

A Yes, I think you would have to say if it was five feet shorter, they may have missed or something like that.

Q Specifically, have you investigated an accident with regard to a truck of a 65-feet in length where if the truck would have been five foot shorter, that accident might have not occurred?

A I can't honestly recall finding that kind of difference. I have investigated accidents of all types where a vehicle had been struck on one end or the other at right angels and in [31] middle, and I presume you could make that kind of an assumption. I just really can't think of any.

Q But there could be theoretically—there could be a situation where that would occur?

A Oh, yes.

MR. AXELROD: I object. I think it's speculation.

MR. PAFF: Q Based upon your experience that situation could indeed occur, could it not?

A Yes, I suppose it could.

* * * *

[50] Q With regard to the more minute distinction, but possibly significant with what we are working with today, the difference between 60-foot double bottoms and 65-foot double bottoms—there is nothing in this study that would tell us anything about that?

A No, there is not. There is no way we can break that down.

* * * *

[54] Q Would you ever see a particular problem with not being able to back up a certain vehicle on the California highways?

A Not really, because vehicles don't back up. Combinations of vehicles don't back up on our highways. The only place you would find this is possibly in a loading situation, near loading docks and/or industrial areas. And unless you have an extreme condition where possibly because of an accident or something and someone is trying to remove a vehicle, then you generally have traffic control.

* * * *

[60] EXAMINATION BY MR. AXELROD

[63] Q Yes. Are there any adverse effects in terms of overall accidents that you believe would happen if you cut the length of vehicle down to 60-feet or to 55-feet?

[64] A No, I wouldn't see any adverse effect unless we're talking about—unless you're thinking in the area that if it would reduce the amount of cargo that could be transported, we would have more trucks on the highways which, I guess, increases exposure and could cause problems.

Q That's exactly what I was getting at. Do I correctly understand, then, that you're saying that decreasing length carries with it the drawback that you can increase exposure?

A Yes, I think that's a theory that's probably reasonable.

* * * *

Q Okay. In terms of overall safety to the public, what would most denigrate safety in your judgment, going from 65-feet down to 60-feet and thereby increasing the exposure, or going up from 60-feet to 65-feet and thereby increasing the size of your target, if you will?

A I think probably the increased exposure.

Q Increased exposure would—

A By going down to the 60-feet.

* * * *

[68] EXAMINATION BY MR. PAFF

* * * *

[71] Q Also, with regard to exposure, when you can talk about exposure in a number of ways. Assuming the amount of truck traffic would increase on a particular highway, wouldn't the amount of exposure of other people to that truck traffic increase?

A Yes.

Q And wouldn't you expect, then, in that situation more accidents as a result of that greater exposure?

A Could be, yes.

Q And directly with that, now using exposure in a different context. If we talk about one vehicle moving from San Francisco to the Donner Pass which is 10-feet longer than another vehicle, in the singular now, we're talking about exposure, [72] doesn't the longer vehicle —setting aside any assumption about reducing the number of trips—doesn't the greater length of that particular vehicle create more exposure in that, you know, singular situation?

A Yes, I would think it probably would have to take up a larger amount of given space.

Q And it might, again, using a broad term "might," but it might create the same type of situation with regard to accident experience, it might go up due to the increased exposure; is that a fair assumption?

A I suppose you could say that. I think you would probably have to talk in degrees.

Q That's true. This whole thing is a matter of degree.

A That's right. A lot of it is conjecture.

* * * *

JURAT

* * * *

DEPOSITION OF JAMES C. CRAWFORD

Filed November 2, 1978

[Caption Omitted in Printing]

* * * *

[3] EXAMINATION

BY MR. AXELROD:

* * * *

Q What is your title, Colonel Crawford?
A I'm Chief of the Minnesota State Patrol.

* * * *

[5] Q Now, have you had the opportunity to observe twin trailers on the highways of Minnesota—
A Yes, I have.
Q —of 65 feet?
And what has the safety experience of the Minnesota State Parol been with respect to 65-foot twin trailers as opposed to tractor-semitrailers?
A Well, we have, since 1973, only recorded one fatal accident with the so-called twin trailers, and we feel it's a pretty safe type of unit.

* * * *

[6] A Well, I think, you know, what you're asking, on the designated routes, which are mostly rural, that the twin would be as safe, or safer than the single unit. Now, when you get into the metropolitan, or urban, then it's, we feel, significantly safer.

* * * *

[8] EXAMINATION

BY MR. PAFF:

* * * *

[13] Q And would that be a concern of yours—that longer length vehicles in a mix with shorter cars?

A No, it doesn't, if—what bothers me the most is the fact that there is the size differential that exists right now, and the five foot, and, you know, the two, three thousand pounds is not significant. I think when you talk about truck size in general—you know, even a 55-foot—and then a Volkswagen Rabbit you're talking about a disaster. You know, that potentially is there, but that exists in the traffic mix today. I don't think the five foot, for instance, between a 60 and 65 is that significant.

* * * *

[23] (FURTHER) EXAMINATION

BY MR. AXELROD:

* * * *

Q And Mr. Paff asked you some questions with respect to passing time, and my question would be: Is the longer passing time that it takes to pass a twin trailer [24] of 65 feet on these designated highways at all significant?

A Not on the designated.

Q And, again, all interstate highways are designated highways. Is that right?

A That's correct.

* * * *

JURAT

* * * *

DEPOSITION OF FRANCIS C. MARSHALL

Filed November 2, 1978

[Caption Omitted in Printing]

* * * *

[3] EXAMINATION

BY MR. AXELROD:

* * * *

Q What is your title, Mr. Marshall?

A Assistant Commissioner of Minnesota Department of Transportation.

* * * *

[4] Q Mr. Marshall, are you designated by the Minnesota Department of Transportation to testify with respect to this matter?

A Yes.

* * * *

[7] Q Are 65-foot twin trailers permitted in Minnesota?

A On designated routes, yes.

Q How long have they been permitted in Minnesota?

A Since July of 1973.

* * * *

[8] Q What vehicle in Minnesota would be the industry standard for general commodity common carriers?

[9] A It would be the 65-foot twin trailer unit.

Q What has been the safety experience of your Department from the time 65-foot twin trailers were first permitted in Minnesota until the present time?

A From its approval in July of '73 until approximately one year later, when we made a check, there was one twin trailer involved in an accident which had nothing to do with the configuration of the unit. It was a slide condition on sheet ice on a very steep hill, so I would say our experience has been very good.

Q And what has the experience been since the first year?

A I have made only one spot check since then and that was verbal conversation with our District Traffic Engineers, and they responded to me that they saw it as no problem.

* * * *

[11] Q What has the experience of the Minnesota Department of Transportation been with respect to 65-foot twin trailers under Minnesota's adverse weather conditions, such as snow, or ice, or high winds?

A They have been performing equal to or better than the standard tractor-trailer combinations. They have not been identified by our traffic, or maintenance engineers as being any problem.

Q As a result of Minnesota's safety experience with 65-foot twin trailers since 1973, Mr. Marshall, would you have any hesitation in recommending 65-foot twin trailers to other jurisdictions?

A No, not from a safety point of view, a far as their performance.

* * * *

[13] Q Now, assuming that you have drivers of equal abilities, and assuming the same degree of maintenance, and assuming proper loading, and assuming the same roadways and weather conditions, do you still have an opinion as to the relative safety of the 65-foot twin trailer equipment as opposed to the equipment in tractor-semitrailers?

A Based on our experience I would say they were safer.

* * * *

[17] EXAMINATION

BY MR. PAFF:

* * * *

[27] Q And why did you think it judicious to restrict these longer vehicles on other segments of the road?

A Because of the political decision there. The trucking industry was only asking for certain routes. The legislators were only inclined to give certain routes under certain conditions, and with that political [28] climate I felt for me to indiscriminately approve routes all over the State would have been contrary to the intent of the law.

Q Is there any basis for your decision other than the fact that you wanted to deny them particular approvals that they sought?

A My only basis so far for denial has been based on my testimony, when asked a direct question in front of the Senate Transportation Committee, as to whether I would abuse the law that was passed.

Q Have any been denied because of some feeling of concern of safety on your part?

A No.

* * * *

[29] Q Do you do any truck studies, with regard to the approved routes, as to how many 65-foot twin trailers are using them?

[30] A No, we do not. We do—we take truck surveys, but we do not differentiate between twins and straight rigs.

Q Has the traffic on these various routes increased as a result of Minnesota's designation?

A Not appreciably.

Q And what do you mean by that, sir?

A Some trucking companies have been able to reduce, I'm sure, the number of trips because they have more flexibility in the twin trailer and they have more cubic area of payload.

* * * *

[57] Q Now, with regard to that accident in Roseville, would it be a safe statement to say that the bigger the

vehicle was that went into this outer control situation, the more apt it would be to hit something, or do some damage?

A The bigger the vehicle, the larger the mass the greater the damage to the object struck on impact.

[58] Q And plus the greater—

A I shouldn't say, "the bigger." The heavier. The heavier.

Q And how about sheer size?

A I think mass—weight has more bearing on damage than does size.

Q No; I'm speaking with regard to a matter of physics. Isn't a bigger object just more apt to hit something? If it's five foot longer it's—

A Oh, yes, but I'd rather get hit by a pillow than a pound of lead.

* * * *

[60] BY MR. AXELROD:

Q Now, in your journey on I-35 through Iowa to Des Moines that you've just referred to, did you see any part of I-35 in Iowa which, in your judgment, would not be adequate for 65-foot twin trailers?

A No.

* * * *

JURAT

* * * *

DEPOSITION OF GEORGE MOBERLY

Filed October 12, 1978

[Caption Omitted in Printing]

* * * *

[4] DIRECT EXAMINATION

BY MR. AXELROD:

* * * *

Q And what is your business or occupation?

A I'm the Engineer of Traffic with the Illinois Department of Transportation.

* * * *

[6] Q Are you familiar with a combination of vehicles known as 65-feet twin trailers?

A Yes.

Q Does Illinois permit 65-feet twin trailers?

[7] A Yes.

Q How long have 65-foot twin trailers been allowed on Illinois highways?

A They were allowed on designated highways in 1963 with a permit from the Department; and then in 1967 the legislation was revised to permit them without permit to travel on any four-lane highway and other highways designated by the Department.

Q And you testified that you are the official in Illinois who is responsible for designating 65-feet twin trailer highways.

A Yes.

* * * *

[8] Q What has the safety experience been in Illinois with respect to 65-feet twin trailers in qualitative terms?

A They've—their experience has been as good as any other truck unit that we have in the State.

Q Do you have an opinion, Mr. Moberly, as to the relative safety of 65-feet twin trailers as opposed to 55-feet tractor semitrailers?

A All of our evidence would indicate that they are equally safe.

Q Mr. Moberly, would you have any hesitation in recommending 65-feet twin trailers to other states?

A No.

Q Does the fact that 65-feet twin trailers are—strike that.

Does the fact that 65-feet twin trailers are not permitted on all highways in Illinois carry with it any judgment by you that 65-feet twin trailers would not [9] be safe on these highways?

A No.

Q Why, then, aren't they permitted on all highways?

A The Legislature, in authorizing the Department to designate routes, indicated that there should be some consideration and limitation given to those. We developed a series of criteria that we thought would permit them where they were most generally needed and limit the routes in those areas where normally there was very little need of activity.

* * * *

[14] Q Do you know the reason why 65-feet twin trailer traffic would appear to be heavier on U.S. 36 as opposed to some of the other highways in the State?

A In part, I believe it's due to the fact that they can't go from the northern part of our State or other states around the Great Lakes straight west through Iowa. Therefore, they have to drop down and go west through the central part of this State in order to go into Missouri and on west.

* * * *

[15] Q Does the Iowa ban on twin trailers—on 65-feet twin trailers have any effect on traffic safety in the State of Illinois?

A Well, it certainly forces a number of trucks to use a longer route through the State, and it forces a number of trucks to utilize two-lane routes as opposed to four-lane routes. And both of those conditions would indicate that simply mathematically there ought to be more accidents because of that.

Q How many additional miles in fact does the Iowa ban require a twin trailer operator to travel, say, when he heads west from Chicago to the West Coast?

A Well, it's something like 160 miles across the State in the Interstate 80 line. From Chicago to Springfield to Quincy is something like 320 miles.

Q So you're in fact doubling the mileage in the State of Illinois as a result of the Iowa ban.

A Yes.

* * * *

[16] CROSS-EXAMINATION

BY MR. PAFF:

* * * *

[29] Q Now, you state that you have not had a highway accident rate with regard to the operation of 65-foot double-bottoms; is that correct?

A I think that I said that I have no evidence to indicate there is any higher accident rate with double-bottoms than there is with any other truck unit.

Q Would your office be where that evidence came?

A The accident reports are filed with the Department of Transportation, the Division of Traffic Safety. The Division of Traffic Safety brings to our attention any problems that arise with any particular location or type of operation and provides us any accident information that we request at specific locations or types of operations.

Q In other words, if there was a field problem, [30] it might not get to you because of the level of involvement?

A If there is a field problem, it would normally get to me through our district traffic people. If they are experiencing a problem in the field at a spot location, they forward that information to us with a request for detailed study of that location.

* * * *

[52] REDIRECT EXAMINATION

BY MR. AXELROD:

[55] Q Is there anything about the 60-feet twin trailer that you believe makes that vehicle more safe than the 65-feet twin trailer?

A No.

Q Is there anything about the 55-feet tractor semi-trailer that makes that vehicle more safe than the 65-feet twin trailer?

A No.

Q Is there any reason that you can think of [56] today, Mr. Moberly, that would justify permitting a 60-feet twin trailer on a certain lane—length of two-lane highway in the State of Illinois where you wouldn't want to permit a 65-feet twin trailer on the same road?

A I have no evidence that one is any safer or more operational than the other.

Q Has there been anything in your experience to suggest that the 65-feet twin trailer should, in fact, be restricted to four-lane highways?

A No.

Q In terms of accident rates in general, which would be a safer highway—the two-lane highway or four-lane highway?

A The four-lane highway.

Q How rare or how common are the 60-feet twin trainers in the State of Illinois today?

A Well, I really don't know but we—my general impression is that 60-foot double-bottoms are fairly rare.

Q Mr. Lambert asked you certain questions with respect to the denial of requests for designation of certain highways as 65-feet twin trailer highways. My question is: Have you ever denied an application for 65-feet twin trailers because you thought that the [57] 65-feet twin trailer would not be safe on that particular highway?

A No.

* * * *

JURAT

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DEPOSITION OF JAMES L. ADKINS

Filed October 12, 1978

[Caption Omitted in Printing]

* * * *

[4] DIRECT EXAMINATION

BY MR. AXELROD:

* * * *

Q And for the record, Major, you're testifying here today pursuant to a subpoena that was issued by the United [5] States District Court?

A Yes, sir.

Q What are your particular responsibilities, Major, with the Kansas Highway Patrol?

A I have the supervisory responsibility for the south half of the state of Kansas, the Kansas Turnpike, and capital area security.

* * * *

[6] Q When were the 65-foot twin trailers first allowed in the state of Kansas?

A I believe it was in 1965 we started.

* * * *

[8] Q Now given the 13-years experience that the Kansas Highway Patrol has had with 65-foot twin trailers, what is your opinion as to the safety of the 65-foot twin trailer?

A We do not believe that there is a significant safety factor when comparing the 65-foot double to the semi-trailer unit.

Q Based upon the experience of the state of Kansas with 65-foot twin trailers, would you have any hesitation in recommending them to safety officials in other jurisdictions?

A No, sir.

* * * *

[9] Q And during that 13-year period have you received any evidence to suggest that the fraction of a second which it takes to pass the longer 65-foot twin trailer as opposed to the 55-foot tractor semitrailer has any significant effect in terms of safety?

A We do not believe that it does.

MR. AXELROD: That's all I have, Major. Thank you.

CROSS EXAMINATION

BY MR. PAFF:

* * * *

[20] Q Is it a fact, Major, that in the years after 1965 Kansas experienced some difficulties with the operation of twin trailers in Kansas?

A Not that I'm aware of.

Q Okay. Have you seen any studies or referred to any statistics that show the amount of fatalities involved in truck motor collisions increased as a result of the legalization of twin trailers in Kansas?

A No, I don't have statistical information to indicate that.

Q From your field position in 1965 did you observe any specific problems with their operation?

A No. I believe generally as an agency we were skeptical when the operation started up. The length, this kind of thing, tended to bother us in law enforcement.

Q And why does length tend to bother you, sir?

A Well, we felt at the time that it would be a more significant factor than it has turned out to be. * * *

* * * *

[21] The additional length does take a little larger amount of [22] time to complete a passing operation on a two-lane highway. We do not believe that it is a significant safety factor, that amount of time.

Q Now the amount of time would also increase in passing a longer vehicle on a four-lane highway, would it not?

A Yes.

Q Now with regard to that and that fact alone, the passing time, with your experience as an officer in law enforcement and investigating accidents and so forth, have you investigated accidents where an accident could have been avoided or in your opinion would have been avoided if the times involved had been a second or two different?

A Yes.

Q Any accident involving passing that created a hazard or created a safety concern in your behalf?

A Have I investigated this type accident?

Q Yes, sir.

A Yes, I have.

Q In other words, timing is very critical in terms of safety on the highway, is it not?

A The driver's estimate of the time required to pass is very critical, yes.

* * * *

[26] REDIRECT EXAMINATION

BY MR. AXELROD:

* * * *

Q You also indicated to Mr. Paff that in the beginning in 1965, that you were skeptical about twin trailers because of their increased length, and my question is, sir, is [27] whether your skepticism has been overcome in the last 13 years based on actual twin trailer operations in this state?

A Yes, sir, it has.

* * * *

JURAT

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DEPOSITION OF ARLAND V. HICKS

Filed October 27, 1978

[Caption Omitted in Printing]

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[4] DIRECT EXAMINATION

BY MR. AXELROD:

* * * *

Q Now what is your title, Dr. Hicks?

A Transportation Safety Administrator.

Q And that's in the Kansas Department of Transportation?

A Yes.

* * * *

[8] Q Given now over ten years of experience with 65-foot twin trailers in the state of Kansas, what is your opinion as to the safety of 65-foot twin trailers?

A We have identified no problem peculiar to twin bottom trailers.

Q And do you have an opinion as to the relative safety of [9] 65-foot twin trailers as opposed to 55-foot tractor semitrailers?

A My opinion is there's no significant difference.

* * * *

[28] Q Has there ever been a situation in which you've closed a highway to the operation of 65-foot twin combinations and no other vehicle?

A No.

* * * *

[29] Q And what would be those occasions where you would designate a particular detour for truck traffic as opposed to automobile traffic?

A This would primarily be in a city area where the traffic congestion is such that all trucks should be limited.

Q Does a longer truck create any difficulties in a more congested area, in your opinion?

A Yes.

Q And would five feet be a significant distance with regard to a longer truck in a congested area?

A In my opinion it would not be significant.

Q Would ten feet be a significant difference with regard to truck length?

A I would accept ten feet as being significant.

Q And why would ten feet be significant?

A When one has opinions based upon observation and records and what have you it's real difficult to say why one picks one figure over another.

* * * *

[35] Q Now assuming, Doctor, that the evidence in this case establishes that the state of Iowa by prohibiting 65-foot twin trailers had the effect of forcing those twin trailers off I-80 through Iowa and down onto U.S. 36 in Missouri and Kansas, what effect on safety would that have, Doctor?

* * * *

A I would answer that question in this aspect: that as any type of traffic increases on a highway the numbers of accidents go up, and this is especially true on a two-lane road and more especially true on a two-lane road that is not full pavement width or with full shoulders.

Q Is Highway 36 without shoulders and full pavement in sections?

[36] A Yes, in a number of locations.

* * * *

[38] RECROSS EXAMINATION

[39] BY MR. PAFF:

* * * *

[40] Q And with regard to passing a 55-foot single and a 60-foot—strike that: and a 65-foot double combination, would you see that passing time as being significant?

A It would be about eight percent additional and I would not find that to be too significant.

Q What do you mean by too significant?

A Eight percent is identifiable and is measurable, therefore it's significant, but I would not attach a great deal of significance to it or weight or importance.

Q Okay. In one specific accident might that be a critical difference?

A Yes.

Q Okay. Now with regard to the overtaking vehicle passing a 60-foot double combination, in that situation that would mean an additional pass of five feet, is that [41] correct?

A Yes.

Q Now would that be quantifiable in terms of time?

A Yes.

Q And what percentage would that be, sir?

A Well, the difference between 60 and 65 is five feet and five-sixtieths would be one-twelfth, one-twelfth is six and two-thirds percent, I believe—no, correction, about eight percent.

Q And would you view that difference as significant in the overall traffic operation?

A In the overall traffic operation I would not.

Q But again in a specific situation, in a specific accident that occurred that might become significant?

A Yes.

* * * *

[55] REDIRECT EXAMINATION

BY MR. AXELROD:

Q But you're not aware of any of these specific situations right now, Doctor? These are all hypothetical, I take it?

A These are most unlikely and are hypothetical.

Q Okay. And being unlikely and hypothetical, do you believe that a safety judgment can reasonably be made to exclude 65-foot twin trailers on the basis of those unlikely hypotheticals?

A It would be my opinion that they would not.

* * * *

JURAT

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DEPOSITION OF CLAUD R. MCCAMMENT

Filed March 2, 1979

[Caption Omitted in Printing]

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[5] DIRECT EXAMINATION

QUESTIONS BY MR. VARDA:

* * * *

Q What is your occupation, Mr. McCamment?

A At the present time I'm retired. I've been doing consulting work for attorneys, and also up until about five months ago, I was a consultant for the Automobile Club of Kansas.

[6] Q Is that the local Triple A affiliate?

A Yes. It's the state automobile club.

* * * *

[11] Q During the course of your duties as Safety Director for the State of Kansas Highway Department, do (sic) you have occasion to study the operational characterization of the 65-foot twin trailer?

A I do—I did, I mean.

* * * *

[14] Q Could you describe the study you've performed on these 65-foot twin trailers?

A I might—yes. I might say that this was on official action of the Highway Commission. We have a director and six-member commission, and they felt that our department was the only department that was qualified to make the study.

* * * *

[17] Q During—how long did the study of twin trailers last?

A The complete study lasted over a period of approximately three years.

Q During this time did you monitor in any way accident reports?

A Yes. The accident reports section was required to put into a special file all accidents involving twin trailers and all accidents involving semis.

* * * *

[19] Q Now, what were the results of the study?

A The summation of the study was made after I personally had traveled with several of our engineers and enforcement people over practically all of the original routes that permission had been requested for approval on and had followed double bottoms, twin trailers in rain, under all types of adverse weather conditions and at night, and examined the reports of the individuals making the studies that were made to me personally—these reports were made to me personally, and identification by license number of the vehicle that was being studied. We examined the—as a part of this study we examined the tracking of the vehicles, whether they stayed on their side of the road, whether or not they were affected by the velocity of the winds, whether or not the adverse weather conditions caused any problems to not only their tracking and staying on their side of the road, but to the vacuums caused by their wheels so that other vehicles going in the same direction and passing them were caused any more inconvenience or, in bad conditions, than that was caused by these vehicles passing semi-trailer trucks on these same highways. We found that weather conditions did not affect the double bottoms nearly as much as the wind conditions affected the semi-trailers [20] because where the breaks in between the double bottoms were, where the pintle hooks were, the air was able to go through—the wind was able to go through that area, where on the long semi-trailers that were 42½ feet in length, they often times were caused to jackknife or other conditions to occur that did not occur to the double bottoms under the same conditions.

* * * *

[21] Q With respect to passing maneuvers, did you note anything unusual about passenger automobiles and their passing maneuvers with the twin trailers?

A We not only didn't notice this, but we had other vehicles at various times from our department pass the units and not ask them until after they had passed as to any—

* * * *

[22] And the people said that they had more wind spray from the first units—not even identifying them; the first units were the semis—and muck was sprayed onto their windshields than they had when they were passing these second units, the same day, the same hour, the same place.

Q Mr. McCamment—

A In turn, I personally, with my driver, passed a number of these units and a number of semi units and noted personally that less muck and spray was thrown onto my windshield during this inclimate weather by the double bottoms, by far less than by the semi trucks on the same highway and at the same time.

* * * *

[23] Q (By Mr. Varda) Mr. McCamment, during the three-year study, did you happen to note the characteristics of—the hill-climbing characteristics of the 65-foot double bottoms?

A I did.

Q And could you describe those characteristics?

A Well, yes. The hill-climbing ability of the double bottoms was not hindered nearly as bad as with some of the semi-trailers, especially under inclimate weather when there was ice and snow on the highways. Their tracks appeared to be much better because they appeared to—they not only appeared but they did have more tire surface on the highways than the semis and they were better under control when braking conditions, going downhill, occurred. So they didn't jackknife [24] nearly as much when the road surfaces were slippery as did the semis.

Q Did you have occasion to note anything about the maneuverability of the 65-foot twin trailer as opposed to the 55-foot semi-trailer?

A The maneuverability of the twin trailer is much better than the semis.

* * * *

[25] Q What were your final recommendations to the Highway Commission?

* * * *

[26] A I recommended to the Highway Commission and prepared a resolution for the Highway Commission's approval for the use of these double bottoms or twin trailers on our two-lane highway system. * * *

* * * *

[28] * * * House Bill No. 563, prepared by the Committee; and in that they made the changes that we recommend—that I recommended and that the Commission recommended, as I testified before this committee in regards to this matter—since previously I had testified on three different occasions against the use of the double bottom 65-feet in length, and now I was changing my testimony based upon actual studies of their operation upon our highway system.

* * * *

[36] Q Mr. McCamment, during your years as Safety Director and from your experience in reviewing the accident records and the general accident safety statistics of the State of Kansas, can you derive any conclusions with respect to the effect of increasing vehicular mileage on the number of accidents?

A Oh, correct. The greater the exposure, the greater number of accidents.

Q And when you say exposure, are you referring to mileage?

A Mileage traveled, number of vehicles on the highways.

Q Are you familiar with Highway 36 in Kansas?

A I am.

Q And particularly I invite your attention to the northeast corner of that highway in Kansas. Do you [37] recall the accident experience that you had had on that section of highway during your tenure as Safety Director?

A The accident experience was very bad.

Q Now, again—

A We recommended that to have top priority for reconstruction purposes. It's now, as I understand it, all contracted. It should have been contracted years ago for reconstruction.

Q But at this point in time, however, Highway 36 in the northeast corner of Kansas has not been upgraded. Is that your testimony?

A Just a limited part of it.

Q Now, again, drawing on your experience as Safety Director in Kansas, can you state any general observations with respect to the relative accident experience on two-lane as opposed to four-lane divided limited access highways?

A The accident experience in Kansas on four-lane limited access highways such as the interstate system is approximately 66% better. In other words, there were three to one ratio more accidents on the two-lane system than on the interstate system.

* * * *

[39] A We actually have made studies, both on the two-lane highway system and on the interstate highway system as to the time requirements for the passing of various lengths and various size of vehicles and equipment moving at various speeds; and we found that the

difference, especially in regard to a ten-foot divergence between our original vehicle, or original trucks were 55 feet in length that were approved by the Legislature that were being passed and the 65-foot length vehicles that were being passed on the interstate system was very minute. In fact, the average person, unless he had a very good stop watch, could not even record the additional time that was required to pass for the additional ten feet.

* * * *

Q (By Mr. Varda) Mr. McCamment, do you feel, based on [40] your experience, that this minute amount of time is significant and passing maneuver in terms of safety?

A Now, you're referring to the interstate system?

Q Yes.

A I feel it's not significant for many reasons. One is that you do not have any approaching traffic on the interstate system. You can make your passing movement at a higher speed on the interstate system and resume normal speed without breaking the laws nearly as much as you would in passing any type of vehicle on either the two-lane or the interstate system because you are not creating a tenseness in passing longer vehicles on the interstate system because you do not have the conflict of the approaching vehicles that you have on two-lane systems.

* * * *

[41] CROSS EXAMINATION

QUESTION BY MR. PAFF:

* * * *

[44] Q What occurred then in 1965 with regard to the Legislature?

A The Legislature at that time passed a bill—passed the law the same as they had considered previously, requiring the State Highway Commission to make the studies as to those highways for the people who owned and wanted to operate 65-feet long twin trailers and requested the same for and authorized the State Highway Commission to grant approval or disapproval [45] for the use of these sections of highways that were requested for use by the various trucking companies and organizations.

* * * *

[49] Q —is that you could have a combination of— which would fit the definition of a double bottom and would be, say, 60 feet in length, could you not, under that statute?

A Yes. You could have a combination, and we do have—often times when individuals are pulling boats and pulling another trailer behind a passenger car, that could be up to 55 or 60 feet.

* * * *

[61] Q So when you stated in your previous testimony that you went 20,000 miles, is that a typo or incorrect?

A It's probably incorrect.

Q Now, with regard to the 2,900 miles that you followed these vehicles, did you ever stop one and measure it to see if it might be a 60-foot combination?

A We measured all of these vehicles that were on certain highways as they entered the state at our weight stations. We have weight stations, permit weight stations where the vehicles are measured as to [62] height, length and, of course, as to weight. We do this because also we make arrests of vehicles traveling with special permits that exceed the special permits. So that our operators in making the weighing operations also make the measurement operation, and the height is recorded because of a height bar at the top.

Q I understand that. Mr. McCamment, my testimony is that when you were engaged in this 2,900 miles of following vehicles, was there any way that you as the driver or sitting in that car can determine whether or not that was the 60- or 65-foot?

A Oh, yes, I see what you're getting at. We also—

Q Or 58-foot or 62-foot?

A We also at certain locations where we had a wide enough area or where we had a roadside park, would have some of these units, many of these units in fact at one time, because on certain days all the units were measured. We measured these. I measured them and I was there when a number of them were measured. I was there when approximately—well, during this whole period I probably was there when between 350 and 400 were measured.

Q Did you find them all to be exactly 65 feet?

A No. Combinations, according to where the pin is put in, and that varies from one to two to three feet. [63] Some of them vary as much as four and five feet. But most of them were 64 to 65 feet in length by far.

* * * *

DEPOSITION OF THOMAS D. DOYLE

Filed October 30, 1978

[Caption Omitted in Printing]

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[2] DIRECT EXAMINATION

BY MR. AXELROD:

* * * *

[4] Q Now, Mr. Doyle, are you familiar with a combination of vehicles known as 65 foot twin trailers?

A Yes, I am.

Q What, if any, was your relationship to 65 foot twin trailers while Director-State Engineer?

A Well, since the Director-State Engineer is responsible for the overall highway system and its [5] operation in the State of Nebraska, any vehicle including these twin trailers which would be operating on our state systems would be under the jurisdiction of the Department of Roads in terms of the operation. So, I would have firsthand and direct knowledge of any circumstances peculiar to that particular configuration, as well as any other as Director-State Engineer.

* * * *

[6] Q How long have they been permitted in Nebraska?

A Since 1965. I believe it was May of 1965 the state law was changed from—to permit from a maximum of 60 up to 65 foot.

* * * *

[9] Q Is it—as a former state transportation official, would you have any hesitation in recommending 65 foot twin trailers to officials in other states?

A No.

Q What particularly has been the safety experience of the 65 foot twin trailer as compared to the 55 foot tractor semitrailer?

A I would have to say the experience is the same, because I'm not aware of any difference.

* * * *

[10] Q Mr. Doyle, would you state whether or not the extra fraction of a second which it takes to pass a 65 foot vehicle as opposed to a 60 foot vehicle or 55 foot vehicle has any significant terms on safety?

A The only significance is that you pass a vehicle based on whether or not you can safely do it, so whether it's 65 or 55, you must allow the necessary time. So, it's a matter of driver judgment more than any other fact as to the absolute length of the vehicle that's important in terms of safety.

Q So, would or would not the extra ten feet have any [11] significance in terms of safety?

A I would say not.

* * * *

[12] Q From your experience, can you state whether or not the Iowa ban on 65 foot twin trailers has had any effect of safety in the State of Nebraska?

A Okay. I have to develop that answer because it's —it has been our experience that the—that the fact that the twin trailers must go through the States of Missouri or South Dakota in order to bypass the State of Iowa where they are not permitted, that these tractors, these trailers do come in the state, for example, northern Missouri, Cherry County drops them off, and at Brownville, Nebraska, they come across on Highway 73-75 which is one of the more narrow and more hilly routes in the State of Nebraska, and by virtue of the fact that there're just simply more trucks on that 73-75 route, there is a greater exposure than there would be if they were allowed to remain on the interstate system. They come through Auburn, Nebraska, the citizens complain about the large amount of trucks. True, not all of the trucks are twins, and therefore, they would be there anyway, but the twins add to the congestion in that sense and because—the twin trailers do in that sense. So, yes, there has to be an effect because of the greater exposure in that sense. [13] Then, they progress onto Highway No. 2, make a turn in Nebraska City to the west and go some 55 miles right past the Department of Roads offices in the state, in the City of Lincoln where they eventually pick up Interstate 80 then go on west. So, yes, there is greater exposure.

Q When you say greater exposure to accidents, what do you mean?

A Two lane road undivided on systems that are not as highly designed as the interstate system. You have more exposure and more congestion. The larger equipment being on narrow roads is just simply going to be a less efficient movement, and therefore, a higher risk.

Q Are you speaking of exposure to accidents?

A To accidents, that's the—to accidents and there's more congestion and slower movement of traffic.

Q With respect to the two lane roads that you mentioned, including Highway 73-75, would you make a differentiation and allow, say a 65 foot tractor semitrailer on these roads and not allow 65 foot twin trailers?

A The length of the truck is not critical in that respect. It's just the fact that there's a better system for any truck to be on, and that's the [14] Interstate System.

* * * *

Q Are you in a position to state whether or not Interstate [15] 80 in the State of Iowa is suitable for 65 foot twin trailers?

A It was built with Federal funds, 90 percent Federal interstate funds, and as a prerequisite for that, necessarily it had to meet the same standards as the State of Nebraska, and therefore, on that basis, it's adequate just as Nebraska is because the condition of the contract with the Federal Government.

* * * *

[16] Q Before, you indicated that the Iowa ban on 65 foot twin trailers resulted in the trailers using two lane highways in the State of Nebraska. Has that resulted in any additional mileage in the State of Nebraska?

A In my judgment it definitely has because the necessity for the north-south traffic in Nebraska, whether they come up 73-75 or some point east or west of that, because the fact that you have to drop down, come across and up on a Nebraska road to get on Interstate 80, considerably more wear on 73-75 Highway, Highway 2 in Lincoln, and I assume, up in the northern tier of counties, the same would be true because of the additional traffic that's on perhaps Highway 20 rather than getting down on Interstate 80 or getting down on 80 and onto 77. So definitely there's more mileage traffic in Nebraska as a result of the circuitous route.

* * * *

[17] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[22] Q Did you, while you were with the Nebraska Department of Roads, initiate any formal studies relating to the safety of these vehicles?

[23] A No.

Q Did you participate in any other studies in connection with any other states that were studying this particular matter?

MR. AXELROD: You personally, or his department?

BY MR. PAFF:

Q You or those under your direction?

A Only to the extent that we would respond to any questionnaire type of information that might have been sent to us, but I don't have any personal knowledge of, to what extent that was done or the period other than from time to time through AASHTO or some other such organization.

* * * *

DEPOSITION OF DENNIS EISNACH

Filed October 17, 1978

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

BY MR. AXELROD:

Q And what is your title, Sir?

A Superintendent of the Highway Patrol.

Q Of the State of South Dakota?

A Yes.

* * * *

[5] Q Are 65 foot twin trailers permitted in South Dakota?

A Yes, they are.

Q And how long have they been allowed in South Dakota?

A The 1959 Legislature passed the law initially allowing this type of unit to be operated in South Dakota and the law would have become effective July 1, 1959.

Q And are 65 foot twin trailers permitted on all roads in South Dakota?

A Yes.

* * * *

[6] Q Due to the experience of the Highway Patrol since 1959 with 65 foot twin trailers and your own eighteen years of experience as a Highway Patrol Officer, what is your opinion as to the safety of 65 foot twin trailers?

A I guess we haven't been concerned with them because over the years there hasn't been anything significant that would indicate to us that there has been a safety problem with those type of units.

Q How would you compare the safety experience with effect to the 65 foot twin trailer as compared to 55 foot tractor semi trailers?

A We don't see any difference.

Q Based upon the experience of the South Dakota Highway Patrol with 65 foot twin trailers, would you have any hesitation in recommending them to officials in other states?

[7] A No.

Q In your eighteen years of experience with the South Dakota Highway Patrol have you received any evidence to suggest that the additional ten feet when comparing a 65 foot twin trailer with a 55 foot tractor semi trailer creates any problems in terms of safety?

A That particular issue, I guess, has never been a concern to us. Like I said, the record hasn't indicated that there is any particular problem with those and, frankly, I guess we have never related it down to the extra ten feet.

Q Have you ever received any evidence to suggest that the extra fraction of a second which it takes to pass a 65 foot vehicle as opposed to a 60 foot vehicle or 55 foot vehicle creates any problems in terms of safety?

A No.

* * * *

JURAT

* * * *

DEPOSITION OF PETER DEN HAMER

Filed October 5, 1978

[Caption Omitted in Printing]

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[3] EXAMINATION

BY MR. AXELROD:

* * * *

Q And what is your occupation or position?

A I am director of safety and engineering for Transport Indemnity Company.

* * * *

[4] Q And as director of safety and research and engineering, do you have any responsibilities with respect to reviewing claim files and loss reports to determine the causes of accidents?

A Yes. We review the file to try to analyze cause, to get the information that is revealed by the adjustor, and we then sometimes go back to the account for more information.

We are looking for cause in our instance and not liability as the claims department does.

* * * *

[5] Q What has the safety experience with Transport Indemnity Company been with respect to the 65-foot twin trailers as opposed to 55-foot tractor semi-trailers?

A No difference. The doubles—we use the word "doubles" here on the west coast—doubles might be slightly safer than the semis.

Q What are the safety advantages of twin trailers or doubles that make them a little bit safer than tractors semi-trailers?

A Greater maneuverability, better braking, and one other item on a set of twins as compared to a semi is that when you get into a congested area, you can break them up and get around in a local community a lot easier than you can with anything classified as a semi.

Q Lastly, Mr. Den Hamer, does the use of twin trailers or doubles have any effect on cargo loss prevention?

A Sure.

Q How is that?

A Like you can load doubles and again break them up and deliver it direct without cross-dock handling, and there is better maneuverability in congested areas for [6] delivery purposes, and you can deliver directly off a 70-foot trailer much easier than a 45 or 55. The less handling, the less exposure.

* * * *

[12] FURTHER EXAMINATION

BY MR. AXELROD:

Q I think, Mr. Den Hamer, it wil be useful if you would explain precisely why there is less cross-dock handling with the twin trailers as opposed to the semi-trailer that results in fewer losses.

A Every time you handle any kind of cargo, it is exposed to damage. The least number of times, the least amount of damage.

Q Now, why—

A So, therefore, on a set of 27's, you can go bring them into a terminal. Most of the time they put a local man on.

They can split them up and deliver directly off. They do not have to go across dock.

Q Is it possible to eliminate some of the break-bulk handling points by using twin trailers?

A Oh, yes.

Q Would you explain why that's so?

A That's—say I am on a run from here to Chicago, which is Los Angeles to Chicago, and you have a 27-foot as opposed to a 40 or 42 and a half feet.

You can load 2,100 in a 27-footer—say, a [13] straight Chicago load. He may not have enough to fill out a 40-foot box, but it is enough for a 27-foot.

If you load a 40-foot, it must be broken out, say, in Oklahoma City, and whatever you put in the back has to be taken out, and in Chicago it has to be taken out and loaded with other freight, because the object is to have a full box payload, so with a 27-foot, you can split the boxes and not handle the cargo.

Q Why is this important in preventing theft?

A Again the box is closed. Most of the time the employees do not know what is in it, and it goes directly to the destination.

Q Does the use of twin trailers have any advantage in terms of misloading and physical damage?

A Yes; yes.

When you are bulk-breaking any cargo, and you have to move it onto other trailers, you depend on people to look at labels and markings, and it can be put on the wrong trailer and sent to the wrong destination.

This is why we like to seem them line loaded, the doors sealed, go to destination and opened without being handled in route.

Q Mr. Paff asked you some questions with respect to old 24-foot boxes which resulted in a configuration of 60-feet.

What is the present industry standard for the carriage of general commodities?

A Twenty-seven-foot boxes overall length with tractor of 65 feet.

[14] Q When did the industry standard change from 60 to 65 feet?

A In the State of California, I think it was around 1960.

* * * *

FURTHER EXAMINATION

BY MR. PAFF:

* * * *

[15] Q Now, with regard to your other comments, you say [16] that that's an industry standard.

Is that the California standard or industry standard?

A It's an industry standard.

Q And who creates the industry standard?

A State laws.

Q Have you read any studies of standards of manufacturers of these 24- or 27-foot boxes or 40-foot boxes?

A Now, are you talking about manufacturing standards?

Q Yes.

A Yes.

Q Will the industry manufacture a box that's less than 24-foot long if you want it?

A Oh, yes. You can order any type of equipment.

Q So there is no industry standard? We are talking about what the state allows on the highway?

A That is correct.

* * * *

JURAT

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DEPOSITION OF THURMAN D. SHERARD

Filed November 6, 1978

[Caption Omitted in Printing]

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[2] EXAMINATION BY MR. AXELROD:

* * * *

Q And what is your occupation, Mr. Sherard?
A Civil engineer.

* * * *

Q And, Mr. Sherard, are you the person that has been designated by the Western Highway Institute to appear pursuant to the subpoena that was served by the plaintiff on the Institute?

A Yes.

Q What is the Western Highway Institute, sir?

A Western Highway Institute is a non-action, nonprofit organization, organized to conduct research in the fields of motor vehicle transportation in the Western United States and the five Western Provinces of Canada.

* * * *

[3] Q What is the historical relationship, if any, between the Western Highway Institute and the development of a combination of vehicles known as 65-foot twin trailers or doubles, as they call them here in the West?

A Well, I came to work for Western Highway Institute in 1965, which was just following the development period of 65-foot doubles in the Western States. But Western Highway Institute was formed in 1947 with the purpose of testing, researching and developing the safety and feasibility of more productive trucks. And the first more productive truck which came into mind was the 65-foot doubles. In 1941, there were three states out here that in the West that already were running 65-foot doubles back in 1941. And these were developed in the Western States as a result of research studies, I wouldn't say completely developed, but I mean the Western Highway Institute were instrumental in conducting the research and providing the data that lead to the adoption of 65-foot doubles in all the Western States.

Q Since you became employed by the Western Highway Institute, what has been your personal involvement with 65-foot twin trailers?

A My personal involvement has been in the testing and [4] research of more productive vehicles in which we used the 65-foot doubles as a standard by which to compare other vehicle configurations. The 65-foot double was known to be, known and accepted in the West to have good safety characteristics, good economic characteristics.

Q What are precisely some of the studies that you have been involved in where 65-foot twin trailers have been compared to other vehicles?

A Splash and spray. Offtracking. Braking distance. Braking stability. Dynamic stability. Traction. Front end loading. Practically all of the research into vehicle characteristics and safety characteristics have involved the doubles as a comparison with other vehicles.

* * * *

[7] Q I show you what has been marked as Sherard Exhibit No. 2 and ask if you can identify this exhibit?

A That is a report of our Technical Research Committee involving several splash and spray tests. It is the report of that committee. I was involved in setting up the tests and supervising the tests, and in coordinating and writing the final report.

Q What is meant by the term splash and spray?

A There are really two things involved with splash and spray. One is splash, which is the large droplets that are thrown outwardly by the truck tires at the impact with the road surface.

Spray is a product of splash when it impacts the side of the truck or the under-carriage or is thrown around by the truck's tires, and at a high velocity when it impacts these surfaces it is atomized into very fine droplets. Then the aerodynamic disturbances of the vehicle throws it outward and in all sorts of directions, depending upon what the aerodynamics of the vehicle are.

Q Why are various splash and spray characteristics of vehicles important in assessing highway safety?

A Well, it is a matter of visibility, especially in passing. There has really been no accident statistics that have shown [8] any great degree of accident severity resulting from splash and spray, but it is a visibility problem which is of concern to the passing driver.

* * * *

[10] Q Before I ask you about the worst, tell me which configuration was the best or created the least splash and spray?

A The twin trailers configuration produced about 80 percent of the total emitted by the worst configuration.

Q And which vehicle combination put up the worst all-around characteristics in terms of splash and spray?

A The worst, actually, there were three that were fairly close, the van, the tractor-semitrailer, 55-foot tractor-semitrailer with the van. The tank semi. And the autotransporter. The tank semi was probably a little more severe than the other two.

Q Would you compare in terms of severity of splash and spray the 65-foot twin trailers as opposed to the 55-foot tractor-semitrailer?

A Well, the tests made by Southwest Research Instistitute and the tests made by Systems Technology and Aerodynamics of Southern California have all produced the same answer, that the twin trailers, 65-foot twin trailers are about 20 percent, put out about 20 percent less splash and spray than the 55-foot tractor-semitrailer unit.

Q And how did those findings compare with your own findings?

A Identical.

* * * *

[11] Q To what do you attribute these variations between the 65-foot twin trailer in terms of splash and spray and the tractor-semitrailer and these other vehicles?

A Basically, it is the axle configuration. The twin trailers have single axles throughout. Your tank truck, your autotransporter, your tractor-semi have tandem axles. The tandem axles are working in opposing directions so that the wind current are thrown off by the wheels, are meeting at a point just above and between the two tandem axles, causing a great area of turbulence which is blasted outwardly and various spray with it.

The other reason, with the tractor-semi, the 40-foot box on a 55-foot tractor-semi is that you have a large area which creates a greater turbulence and this is also blasted outwardly and carries the splash and spray with it.

The tank truck creates an updraft along the sides of the tank which makes a pattern which goes out farther and higher than the other. The autotransporter you just have several loads, you have quite a few loads in there all working in different directions and creating different forces and different turbulences when they oscillate, which creates a very severe turbulence pattern.

* * * *

[13] Q How did the original Fort Stockton tests compare with the later tests that you did in Oregon?

A There was no difference between—the only thing we did in the later tests is that we verified visual readings and previous tests with more sophisticated instrumentation. But they correlated in every respect.

Q Have your test findings been verified by any other research agency?

A Yes. As I mentioned, the Southwest Research Institute. The Systems Technology, Incorporated of Hawthorne, California. Aero-Environments. I forget their address, it is near Los Angeles. Also the Oregon Highway Department has made tests of their own which verify ours.

* * * *

[15] Q Could you compare 65-foot twin trailers and 55-foot tractor-semitrailers in terms of offtracking?

A The equation for offtracking is a formula which involves basically the square root of the sum of the squares. So a long wheelbase vehicle will offtrack considerably more than a short wheelbase vehicle or a combination of short wheelbased [16] vehicles. So the 55-foot tractor-semi offtracks, say, on a 90-degree turn appreciably more than your 65-foot twin trailer combination.

* * * *

[17] Q Could you compare a 65-foot twin trailers and 55-foot tractor-semitrailers in terms of maneuverability?

A 65-foot twin trailers are more maneuverable than the 55-foot semi.

* * * *

[18] Q Can you tell us whether there is any significant differences between twin trailers and tractor-semitrailers with respect to fishtailing?

A Well, there is—both vehicles operate well within the limits that are set forth in the Federal law that you can't deviate more than three inches to either side of the wheel path of the preceding axle. The fact that your tractor-semi has tandems on the back and one less point of articulation might be a very, very small percentage in its favor, but I don't think you could probably notice it. But in any case, they are both well within the limits.

* * * *

[19] A You have two types of jackknifing. You have the tractor jackknife and the trailer jackknife. The tractor jackknife is where the trailer overrides the tractor and pushes the rear wheels of the tractor out of line and they jackknife, they fold up with the trailer swinging around to meet the tractor.

The trailer jackknife is where the rear wheel of the trailer loses traction and the trailer swings around rather than your tractor axles losing their traction.

Q Would you compare 65-foot twin trailers and 55-foot tractor-semitrailers in terms of their propensity to jackknife?

A Well, you are much more liable to get a tractor jackknife with the 55-foot semitrailer combination. For one thing, you will have the advantage of the extra length. You have one solid mass behind your tractor drive axles so that when you get the forces overriding, you push the tractor axle out of line and you result in a tractor jackknife.

With a twin trailer combination, it is more probable to get a trailer swing or a trailer jackknife. The rear wheels of the trailer will lose traction and swing around. This type of a jackknife is easier to recover from because the tractor is still in a straight line and by accelerating he can pull the vehicle back into its original configuration.

With the tractor jackknife, it is much more difficult to recover from it, after you get beyond 15 degrees, why, you have lost it.

The other thing in favor of the doubles is the fact that [20] the second trailer tends to cancel some of the deviant forces or some of the side forces which are trying to cause the jacknife, the second trailer will cancel some of the forces and you won't have as many side forces working at your rear and as you would have with a single trailer combination.

Q Would you compare the 65-foot twin trailers and the 60-foot twin trailers in terms of the propensity to jackknife?

A With the same weight?

Q Yes.

A I would say that the 60-foot would have a very, very slight tendency, if any, to jackknife faster than the 65-foot, because of the additional stability due to the length, additional 5-foot length.

Q What is meant by the terms dynamic stability and braking stability?

A One is the stability during the braking operation. The other is the dynamic stability is the stability as the truck goes down the highway in normal operation.

Q How does the dynamic stability of 65-foot twin trailers and 55-foot tractor-semitrailers compare?

A About equal. As I mentioned on the question about fishtailing, I think that applies to your question there.

Q Okay. How does the braking stability of 65-foot twin trailers and 55-foot tractor-semitrailers compare?

A Our tests have shown that the 65-foot doubles brake in a shorter distance than the 55-foot tractor-semi, under the same load.

Q Why is that?

A Due to the fact that you have [21] a little more braking horsepower per unit of load. You have your axles spaced more evenly on the pavement surface. I think that is probably the—

Q How does the braking facility of a 65-foot twin trailer compare to that of the passenger car?

A On a dry surface, high coefficient pavement, the automobile can stop in much shorter distance and probably in a fairly stable condition. But when you get into lower coefficient surfaces such as wet surface or icy surface or snow pack surface, the twin trailers exhibit better stability and also better braking distance.

Q Is it desirable that twin trailers and tractor-semitrailers be able to stop in the same distance as automobiles?

A It would be highly undesirable I would say.

Q Why is that?

A Well, I think if a truck stopped in the same distance on a dry road as a passenger car does, you would break the structure down, you would probably collapse your suspension and you might have your cargo coming through the back of the cab. It is just too many forces there, too much forces to stop in that short a distance.

Q Is slightly longer stopping distances in twin trailers and tractor-semitrailers compensated for in any way by the fact that the vehicles are larger?

A Well, you have got, you are talking now between who?

Q Passenger cars.

A A passenger car. I think you have two big advantages in the twin trailer operation. First is that you generally have [22] a professional driver who knows his business and is trained in operating the vehicle. The second is that he is sitting up where he can see much farther ahead and so he is prepared for unexpected things that might require sudden stops.

Q Will the allowing of 65-foot twin trailers in lieu of 60-foot twin trailers or 55-foot semitrailers have any effect on the number of truck trips?

* * * *

A It should reduce the number of truck trips; if you put the goods in a 65-foot twin trailer, you have five more feet of cargo space so you would actually be eliminating trips.

MR. AXELROD: Q You may have already answered this, but how prevalent are 60-foot twin trailers today?

A I don't know that I have ever seen one here in the West.

Q In terms of the states with which you are familiar, what vehicle combination would be the industry standard in terms of the transportation of general commodities?

A Well, in the Western States and in the Western Provinces of Canada, the 65-foot twin trailers is really the work horse you might say for general commodities.

* * * *

[23] Q What does the term cubing out mean?

A That means when you fill your boxes with freight before you reach your weight limits. You have utilized all the cubic area before you reach your weight limits.

Q And can you tell us whether or not this phenomenon is significant in terms of general commodity carriers?

A It is becoming more significant all the time. The density of freight intercity and general freight commodities has been decreasing at a steady rate for, gosh, the last 15 years. And it is now down to where in the Western area in particular, it is down in the area of 8 and 9 pounds per cubic foot. One of the main reasons for that is the packaging of goods. Goods that used to be hauled in bulk are now put in cardboard cartons and plexiglass cartons and they take up a lot of space for one little item. So space really becomes a very important item with the general commodity carrier.

Q Do you have an opinion as to whether 65-foot twin trailers [24] operated on four lane interstate highways are more safe or less safe than 55-foot tractor-semi-trailers operated on the same highways?

A Well, I just want to say that 55-foot tractor-semi is a very safe vehicle and that the 65-foot twin trailers are just as safe, possibly a little more. I think the statistics and tests have shown it to be a safer vehicle. But I want it understood that both vehicles are very well within the safety requirements.

Q Do you have an opinion as to whether a 65-foot twin trailer operated over a four lane interstate highway would be less safe or more safe than a 60-foot twin trailer operated over the same route?

A Well, that is getting into nit-picking. I just, I mean the 5-foot difference is so hard to evaluate. It is certainly, 65-foot trailers certainly would be just as safe and because of the, again the factor of length that was brought out in the study by Illinois Institute of Technology, the additional length is an additional safety factor. Like I say, I just haven't been around 60-foot doubles enough to make some real quantitative, bring up any quantitative data on that.

Q In terms of passing with a 65-foot twin trailer on an interstate highway as opposed to passing a 60-foot twin trailer on an interstate highway, is the additional 5 feet in any way significant in terms of additional passing time?

A Let's see, the average pass is made at about 10 miles an hour speed differential and that is 14 feet 8 inches per second. So it would be about one-third of a second longer to pass the [25] 65-foot rig than a 60-foot rig.

* * * *

Q And how significant would that one-third of a second be in terms of safety on a four lane interstate highway?

A Well, I think your judgment is as good as mine there. It is pretty insignificant.

Q Could you—

A The one thing about passing length that has been proven in several tests and particularly by the Nevada Highway Department, that is that the tendency for a passing vehicle is to accelerate during the pass in proportion to the length of the vehicle. So that the average passing time is almost the same for a 70-foot vehicle, say, as for a 50-foot vehicle because people get up, when they start their pass, they see it is a little longer than they have been used to, they just step on the accelerator a little more and hold their speed a little longer, before they go around the total elapsed time of pass is about the same. I don't know how you can split one-third of a second down much.

* * * *

[29] Q Did the twin trailers which met the standards of MVS 121 in Sherard Exhibit 6 have the electronic gear—

A No.

Q —that is now required?

A No.

Q Were they able to meet the Federal standard without the electronic gear that is now required?

A Very easily. But I think I better point out that these doubles or these twin trailer configurations were equipped with a faster transmission and release valve which got the air back to the rear axles simultaneously with the application at the front axles.

* * * *

[31] Q What about backing up twin trailers on an interstate [32] highway, would that have any effect?

A Our tests have shown that there is no problem there, that you can back up sufficiently to get off the road or get out of the traveled way.

* * * *

Q Have you had the opportunity, Mr. Sherard, to test 65-foot twin trailers under adverse weather conditions?

A Yes. Quite a few times.

Q When and where was this test?

A We tested them on a low coefficient surface at Utica, New York back in about 1967, I guess it was. We put two coats of traffic paints on the surface and made it equivalent to the slickness of a snow-packed road. We tested them in, you want all the places, Alberta, Wyoming, Montana, Washington, Oregon, Utah, Idaho, Arizona, New Mexico, Nevada, California. That is one of the standard tests that we have used in comparing the characteristics of more productive trucks is a test showing their braking ability both in a dynamic—both on high coefficient and low coefficient surfaces.

* * * *

EXAMINATION BY MR. PAFF:

* * * *

[35] Q So it was basically set up by operators of motor truck vehicles on the highway?

A Western operators.

Q And did they receive most of their financing from that particular organization?

A Western Highway Institute receives about 50 percent of its income from fleet operators and about 50 percent from manufacturers of trucks, tires, axles, other truck components.

We do also have members in the railroad field. We have Southern Pacific, Burlington Northern, Santa Fe. We have three ocean carriers, the American President Lines, Matson and Sea-Land. Also membership from numerous banks and insurance companies which are involved in the financing accident responsibility of trucks.

Q To your knowledge, is Consolidated Freightways a member of that organization of carriers?

A Of Western Highway Institute?

Q Yes, sir?

A Yes.

Q Is Transport Indemnity Casualty Company also a member of that?

A Yes.

* * * *

[38] MR. PAFF: Q I believe you said then that, what do you mean by the more productive trucks, was

that the charter purpose of this organization to study basically how to make—

A Yes, the policy that has been set forth by our executive committee is to find ways and means to improve the safety, the efficiency and productivity of existing components of trucks, primarily through the addition of an extra trailer or an extra component to a commonly used configuration.

Q And was this the basic policy of it to your understanding when you joined this organization in '65?

A Yes. It was my first assignment, some road tests of that nature.

* * * *

[44] Q So would you say the speed of the vehicle is more detrimental to splash and spray than the vehicle configuration?

A Well, they are all intertwined. It is very difficult to separate them because your different configurations create different turbulence in the air which, when you involve speed in there, it makes them even worse.

* * * *

[45] Q Directing your attention to that very point, and we are talking about the same configuration of a twin trailer combination, one being an overall length of 60-foot and one being an overall length of 65-foot, you are talking about five additional feet and you are talking about a certain area on the side of the box, are you not?

A Yes.

Q Depending on the height of the trailer?

A That is right. If you are talking only about the air turbulence which is created by the size of the box. But there is other air turbulence and other factors involved with length.

Q I understand that. But according to that particular sentence, that would indicate that if mass, if we are just talking about mass alone, you have air turbulence, more air turbulence?

[46] A If you are talking strictly about area of the side of the box, there is more turbulence, the more the area is, that is right.

Q So that would be a disadvantage in terms of splash and spray with regard to a 65-foot overall length or a 24—excuse me, strike that, a 27-foot box as opposed to a 24-foot box?

A That would be one of the factors which would be negative to offset some of the factors on the 65-foot which are positive.

Q And what are those?

A The greater length between your two axles on the box gives you more open space underneath and so you have more escape area for the air turbulence underneath the box, and you don't have as much outward wind blast from that area.

* * * *

[47] Another thing is your skin friction at the tag end of your box which helps gives you a little downstream effect and offsets a little bit of your turbulence on the side. It is a very complicated subject, as we found after 10 years of testing.

* * * *

[52] Q I believe you said there were some other later tests that verified your basic data from Systems Technology and [53] Aero-Environments?

A Yes.

Q Were you personally involved in any of those highway projects?

A Yes.

Q Have these been within the last three and four years?

A One was in November of 1977 and one was in June of 1978.

Q And which was that?

A They were both at Fort Stockton, Texas, both done under the DOT project reduction of adverse aerodynamic effects of large trucks.

* * * *

[54] Q Assuming the articulation was the same in both doubles and you reduce the length five foot, it is a matter of distance, isn't it, between the axles as to how they are going to track?

A Yes, if what you are trying to get at is would a 60-foot twin trailer combination offtrack better than a 65-foot twin [55] trailer combination, the answer is yes.

* * * *

* * * Or your 65-foot doubles, in the shorter wheel base on your 60-foot would give you a slightly less off-tracking. Normal highway driving I don't think you could measure the difference.

* * * *

[58] Q Have you done any specific studies related to jackknifing?

A Well, we have done braking studies which have always a possibility of resulting jacknifing, on both dry and wet surfaces and on ice. We found on ice that it was easy to jackknife a tractor-semitrailer, but the doubles had more resistance to folding up and getting out of line.

Off the record.

(Discussion off the record.)

MR. PAFF: Q I believe it was also your testimony, Mr. Sherard, that when you get in trouble, so to speak, and have a jacknifing situation with a double, that the guy can

* * * *

[59] shoot on more power and the back trailer tends to hold that second trailer in line. Is that correct?

A No. What I said then is that you are more apt to have a trailer jackknife with a set of twin trailers which means that your rear wheels of your rear trailer start to lose traction and swing around. The tractor is still going straight ahead. So by accelerating, he can pull the configuration back into line because he still has traction on his drive axles and direction on his tractor axle. But on the other one, if you jackknife your tractor, your tractor is not going in a proper direction and you have lost traction on your drive axles. So you get into deep trouble.

I think maybe the thing I mentioned that you are referring to is the fact that the rear, the second box has, cancels some of the deviant forces.

* * * *

[67] Q And you would be in the area of splash and spray for a longer time passing a longer vehicle?

A That is right.

Q Now, I believe you discuss—

A But intensity, the thing that is important there is the intensity, and the intensity on the tractor-semi is such that you have probably are flying blind for the whole time, whereas with the doubles it is 20 percent less intensity, you may be able to see through or you may be able to see daylight sooner.

* * * *

[68] Q But it [the fast air transmission valve] is not a Federal standard with regard to braking of trucks, is it?

A No. You see, trucks are required to meet a standard which is that they be able to stop within a prescribed distance within a 12-foot lane, and it is an end result type specification which does not spell out what you have to have on the truck in order to do it. They put these systems on there because they know from a safety standpoint it is plus and an accident cost them a hell of a lot of money, so they are doing the best they can to prevent accidents.

* * * *

JURAT

* * * *

SHERARD DEPOSITION, Exhibit 2

* * * *

SPLASH AND SPRAY CHARACTERISTICS OF TRUCKS AND TRUCK COMBINATIONS

Research Committee
Report No. 5

Western Highway Institute

* * * *

Comprehensive controlled tests of nine different splash and spray suppression devices and thirteen separate truck configurations were conducted in July of 1972. This is the last test included in this report. It may have provided the clue by which the total problem, rather than just the problem at the rearmost wheels, can be solved.

* * * *

[70] Section 3. Ft. Stockton Test, July, 1972

* * * *

[72] d. Test Equipment

Ten different types of trucks, truck-trailers and semitrailers allowed the evaluation of fifteen different configurations which represent the basic characteristics of a majority of commercial vehicles in daily operations on major highways.

* * * *

[91] Summary and Conclusions

* * * *

[92] (4) Of eleven typical truck and truck combination configurations, the truck tractor-tank body semitrailer was rated as having the most severe splash and spray characteristics. In second and third positions respectively in the most severe category were the autotransporter and the truck tractor-40-foot van semitrailer combination [55 ft. semi].

The typical 65-foot doubles combinations was rated as creating the least splash and spray.

* * * *

SHERARD DEPOSITION, EXHIBIT 3

AR-955

TRUCK SPLASH AND SPRAY TESTS AT MADRAS, OREGON

SwRI Project No. 11-4029-001
Contract No. DOT-HS-5-01040

Thomas E. Ritter

October 1974

FINAL REPORT

Prepared for

National Highway Traffic Safety Administration
Department of Transportation
Washington, D. C. 20590

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* * * *

[17] The results of the photometer measurements compare closely with those results obtained with the densitometer. * * * To summarize the results of the photometer data, * * *. The triple- and double-trailer vehicles produced the same amount of spray, which was 20 percent less than the bogie vehicle. [The bogie vehicle was the 55 foot semi].

* * * *

DEPOSITION OF FRED J. MYERS

Filed November 6, 1978

[Caption Omitted in Printing]

* * * *

[2] EXAMINATION BY MR. AXELROD:

* * * *

[3] Q And what is your position or occupation, sir?

A At the present time, I am a consulting engineer and retired.

Q And from what firm or office are you retired, Mr. Myers?

A Western Highway Institute.

Q And do you have any present association with the Western Highway Institute?

A Working for them on a consulting basis.

Q And what was the position that you held with the Western Highway Institute prior to your retirement?

A I was Director of Research.

* * * *

[4] Q What is the historical relationship, if any, between the Western Highway Institute and a combination of vehicles known as 65-foot twin trailers or as doubles here in the West?

A Well, that goes back many years. Of course, even before Western Highway Institute was started, we were operating doubles combinations in, I believe, all but one of the Western States, at shorter lengths. We were also operating, of course, the truck and trailer which is the case in most of the states around the country. But after the 1956 Federal Aid Highway Act was passed, which posed the gross weight and the axle load limits, by that time the density of freight had been decreasing until it had reached a rather low level, 12, 13 pounds per cubic foot. One of the great needs of the common carrier, at least general freight common carrier, was the need for additional cubic capacity rather than gross weights and all the segments of the motor carrier industry in the West were interested in a type of vehicle that would give them more cubic capacity within the gross weight limits.

* * * *

[5] Q What was your own particular assignment with respect to investigating 65-foot twin trailers?

A Mine personally?

Q Yes, sir.

A Mine personally, the same as for the Institute as a whole, I might add, was to investigate and determine whether such equipment could be operated on our existing highways which at that time were nearly all two-lane highways, whether they would be compatible with other traffic or whether they could be operated as safely as other vehicles then being allowed under our size and weight laws. What the operating costs might be. What fuel consumption might be. Any savings there, the relative fuel economy. Offtracking, which is a safety factor as well as a factor in the adequacy of the highway plant. The ability of such vehicles to climb grades along with other heavier vehicles.

* * * *

[10] Q When did 65-foot twin trailers come into common use for the first time?

A Well, in the Western States, at least where I am most familiar, of course, I think it would be safe to say that by 1962, we had them operating in all of the 11 Western States.

Q When were they first used out here in the West?

A In the middle '30's, late '30's, I guess they started.

[11] Q What did your research into 65-foot twin trailers consist of?

A What did it consist of?

Q Yes, sir.

A It consisted of an evaluation or a determination to put it that way of—

Q I guess my question should be what procedures did you utilize in making your evaluation to determine whether or not this equipment could be safely operated?

A I see. A large part of our work, particularly back in those days, certainly a major part of the Institute's work, was done upon request from the state trucking associations in connection with the 65-foot combination tests. The plans were made in each individual state to have the tests conducted by or in cooperation with state highway departments, state police and other interested state officials. Reports were prepared sometimes actually by the state officials. That was about it.

* * * *

[16] Q Have there been any change in recent years in the density of freight carried by general commodity carriers and, if so, why so?

A Well, as I mentioned previously, the average density of [17] general freight has been going down for a number of different reasons. Perhaps the most important being the weight of the material that things are now built of, compared to what they used to be. Also, the packaging of freight is vastly different today than it was a short number of years ago. For example, fountain pens used to be several gross of them put in a box and it was heavy. Today, each fountain pen you find it on a piece of cardboard or a piece of plastic over the top of it and it takes quite—only a few of them to fill up a lot of space.

* * * *

[18] Q And does your report compare the offtracking characteristics of 65-foot twin trailers as opposed to 55-foot tractor-semitrailers?

* * * *

[A] The five-axle tractor-semitrailer combination, 55 foot overall, on this curve, would offtrack a maximum of 4.2 feet.

The 65-foot doubles would offtrack three feet.

* * * *

[19] Q How does offtracking relate to maneuverability?

A Well, offtracking is, it is quite important; negotiating curves, it can be a factor in the maximum speed that the vehicle can negotiate the curve, particularly if it is a relatively sharp curve. It is a factor in weaving, if you call it that, or changing from one lane to another. It is a factor in whether the vehicle, the trailing vehicle can trail definitely in a straight line.

[21] Q On four-lane interstate highways, are these differences in passing times significant in terms of safety?

A Not on the multiple lane facility. The four-lane, that is I think all of the interstate has to be a minimum of four lanes, there should be no problem.

Q Does the additional five feet between a 65-foot twin [22] trailer and a 60-foot twin trailer present a hazard in any way on the four-lane interstate highway?

A I don't see why it would.

Q Are there any differences in passing a 65-foot twin trailer as opposed to a 65-foot auto carrier?

A No. Again, your problem is one of the relative length or the difference in length and the difference in speed. Doesn't make any difference what type the vehicle might be.

Q In your opinion, would it be any more or less hazardous to pass a 65-foot auto carrier or 65-foot tractor carrier as opposed to a 65-foot twin trailer?

A No.

* * * *

[25] Q So, comparing the two vehicles, the 65-foot twin trailers and the 55-foot tractor-semitrailers, which

would be the safer vehicle in terms of having less of a propensity to jackknife?

A I would say the doubles.

* * * *

[26] * * * However, all of the data that we have from the individual companies that can provide the statistics, data that have been presented in the various Federal reports, show that the, yes, the five-axle doubles combination has developed a better safety record than your five-axle tractor-semitrailer combination.

And I think that if I may add, that these vehicles, let me take a look at these mileage figures. To me personally, in my capacity in 1969, these are the latest, unfortunately, [27] the latest data that we have, but in 1969, as estimated by the Federal Highway Administration, doubles combinations, and most of these are 65-foot doubles, because even though some of the states do allow 60-foot doubles there is not much use made of them, doubles traveled six billion three hundred sixteen million miles, compared to twelve billion two hundred twelve million for five-axle semis, approximately half, a little over half as much.

* * * *

* * * [F]or the movement of 200 tons of freight, we are using 400 miles, we add the [28] 400 miles so we could compute fuel consumption, but using freight 11 pounds per cubic foot density with the five-axle tractor-semitrailer combination, you would need 137 trips.

With the five-axle doubles, 65-foot doubles, you would need 101 trips. That is 36 trips less.

Was that what you were referring to?

Q Yes. In terms of safety, what is the effect of the state requiring 65-foot twin trailers to use circuitous routes around the state and a substantial increase in mileage?

A Well, the additional exposure and the additional mileage would be a factor insofar as the overall system operation of that company is concerned.

Q Have you had the opportunity to do any research with respect to the fuel consumption of 65-foot twin trailers as compared to 55-foot tractor semitrailers?

A Yes, that is, in recent months has become a very important consideration in truck operations and, as I mentioned a moment ago, we used this 2,000 tons of freight hauled for 400 miles to compute fuel consumption and using what I think is acceptable rates of fuel consumption, miles per gallon or gallons per mile as we have used them here for the movement of this freight, the 3-S2 tractor-semi, it is a five-axle tractor-semi, would require 11,000 gallons of fuel.

The five-axle doubles, 65-foot doubles, would require 8800 gallons, which is approximately 25-percent reduction in fuel. That comes principally, if I may add, from the reduction in the number of trips.

* * * *

[29] EXAMINATION BY MR. PAFF:

* * * *

[45] Q And would a second trailer or a second van in a combination of vehicles be more likely to overturn than one—

A It tends to stabilize it. You will find that the double, whether they are empty or loaded in a high wind, for example, will be a more stable vehicle than the five-axle tractor-semi, for example.

Q Would that apply to a 60- as well as a 65-?

A I can't see that much difference.

Q In your size and weight fact book, I assume this data that you have in this notebook that you have referred to is going to be published in a similar type publication as the Western Highway Institute, for example?

A Yes, I plan to publish it.

Q And there in that book are examples of various configurations of vehicles, are there not?

A Yes.

Q Some as much as 80-foot, two 40-foot boxes pulled by a 10-foot cab?

A Yes. We are trying to cover all types of vehicles that are now in operation regardless of where.

Q Also, there are examples of shorter boxes being put together with longer boxes?

A That is the Wyoming type of combination now, the doubles being used, the 27-foot box behind [46] a 40-foot box. This allows even greater flexibility in the company's operations, if they are operating both types of boxes.

Q But different box lengths are being combined in various Western States also?

A The only one you find it now is Wyoming.

Q But that would create a more flexible situation in your opinion?

A For a company that is operating both types of boxes, he can do his loading better or depending upon where the particular route is, he could drop the 27- and go on with the 40-. Or even drop the 40- and go on with the 27-. It just adds flexibility.

* * * *

[47] Q The advantages of cross dock handling in doubles, I believe you enumerated as better pickup on downtown streets, you can move your requipment around, you can interchange the smaller boxes, and you can ship lower full truckloads at a better rate.

A Carload lots, yes.

Q Those same economic advantages would essentially apply to to 60-foot double bottoms, wouldn't they not?

MR. AXELROD: You are saying now or at the time—

MR. PAFF: Now or in your opinion—

THE WITNESS: Up to a point. Your five-foot additional length could be a factor.

* * * *

[55] Q Now, with regard to power, and I want you to assume now a 60-footer loaded to capacity and a 65-foot double loaded to capacity, which in your opinion—pulling at the same speed—would need more power?

A Loaded to the same weight?

Q Yes?

A The same GVW?

Q Right.

A The same power will do it.

Q With regard to using the same power with both keeping our same example, using both twins fully loaded, which would have the better acceleration characteristics or don't you know?

A I don't know because there are so many variables involved in that, including the driver, that the one might leave the other one at the starting gate and he would be the best vehicle.

Q Assuming it is just a function of mass over distance, the same variables are all controlled—

A Well, I appreciate what you mean. I understand that theory, but there is so much difference between theory and practice that it is hard to compare.

Q But in theory, wouldn't the acceleration take longer with the longer vehicle?

A I think that is correct in theory.

* * * *

[60] Q I think your comments with regard to jackknifing said that, [61] you said that once a tractor-trailer-semi begins to jackknife, there is no way the driver can pull it back into line?

A I shouldn't have said no way, if I did. It is very, very difficult for the driver to get it back, particularly if you have got a wet pavement or low coefficient of friction on the pavement. That trailer is just going to swing around, that is all, and nothing to stop it. They have attempted to invent anti-jackknife devices they put on the fifth wheel. They haven't been too successful. I think they tend to dampen a little bit the effect, but it is still a potential complete jackknifing.

However, a good driver using his brakes and that steering wheel can do a lot to bring it out of the jackknife.

Q The same would apply to a double situation, would it not?

A Yes, but the double, in the doubles it is usually the tractor that loses stability instead of your following trailer, instead of one of the trailers. It is just a characteristic of the brute and I think part of that is due to the fact that, if not all of it, is due to the fact that the one trailer, the box in the rear offsets the forces tending to make the first box jackknife.

* * * *

[67] FURTHER EXAMINATION BY MR. AXELROD:

* * * *

Q You didn't mean to answer Mr. Paff's question by indicating [68] that 24-foot twin trailer boxes would provide greater flexibility than 27-foot twin trailer boxes, did you?

A No, I didn't.

Q As a matter of fact, given your testimony that the 27-foot box was the much more predominant box today, which box in your judgment would provide the greatest flexibility to a common carrier?

A Well, from a very practical operating standpoint, I think you will find in any state or any region or for the country as a whole, that the 27-foot box is the predominant type of vehicle used in the three-axle tractor-semi for pickup and delivery purposes. And after all, that is the genesis of the five-axle doubles. These companies that had been operating five-axle tractor semis, they wanted to utilize their existing shorter boxes and they were 27-foot boxes, and it is a very common type of box all over.

* * * *

Q Do you see any problems in economic terms with interlining 24-foot boxes with 27-foot boxes in the motor carrier industry?

A I think there would be some definite economic problems. If a state does not allow 27- and the 27- is brought in, or it was brought in right to the border, the only way you get that into legal operation in the states is to unload it and reload it. And if it is a full box for interline purposes, whether it had its origin in the state or outside the state, the only way you are going to operate it legally would be to unload it and reload it into a legal box, and the labor involved in unloading and reloading is a heck of a big factor.

* * * *

JURAT

* * * *

DEPOSITION OF ROBERT D. ERVIN

Filed March 14, 1979

[Caption Omitted in Printing]

* * * *

[4] DIRECT EXAMINATION

BY MR. VARDA:

* * * *

[5] Q And what is your occupation?

A Research scientist now.

Q And who do you work for?

A Highway Safety Research Institute, University of Michigan.

Q How long have you been with the Highway Safety Research Institute?

A Ten years.

Q What is the Highway Safety Research Institute?

A It is one of a number of research institutes that are part of the University of Michigan Research Wing. The University has an academic wing and a research wing and in the research wing research units are supported by contracts and grants and gifts from outside sources, the Federal Government, vehicle industry here, State of [6] Michigan, other states, other associations. We do research that's specifically directed at highway safety problems and in my particular activity it's directed at the vehicle's role in pre-crash safety and specifically the handling and braking dynamics of vehicles as it may have something to do with accident avoidance. So, in that capacity the Highway Safety Research Institute is a major activity in the nation involved in heavy vehicle dynamics; the dynamics of trucks and tractor-trailers and buses, and we produce information for sponsors by way of research findings that address specific questions about the way those vehicles behave, questions of that nature.

* * * *

[8] Q In 1977 and 1978 the Highway Safety Research Institute conducted a study of double-bottom tankers unique to Michigan, is that correct?

A Yes. That's right.

Q Now, what makes those double-bottom tankers unique to Michigan?

A The Michigan Road Use Law provides for vehicles which can have up to eleven axles and can have weights up to one hundred fifty-two thousand pounds, and those two descriptions make any of the vehicles that fit that class unique to Michigan. The double configuration that fits that class of eleven axles and one hundred fifty-two thousand pounds is one of the various kinds of configurations that are unique to Michigan.

* * * *

[9] Q Who commissioned the study?

A The study was sponsored by the office of Highway Safety Planning of the Department of State Police.

Q And why was the study requested?

A The study was requested by the governor. I was wondering what you meant by commissioned. It was requested by the governor as a result of a rash of accidents that had occurred over about a one year period involving the heavy type, double-bottom tankers carrying gasoline and the character of these incidents involved fairly frequent fires that were large and created a lot of media attention which led to a political pressure to do something, and so the pressure resulted in September or so of 1977 in the governor asking the study be done and then over the next two months or so a study was defined with us jointly with the office of Safety Highway Planning. That's how it came about.

* * * *

[19] Q How tall is that second trailer?

A Thirteen feet three inches.

Q And what does it weigh when loaded?

A Sixty-five thousand pounds.

Q What do you call the second trailer?

A In all of our work here we refer to it as a pup trailer.

* * * *

[20] Q What is the effective wheel base of that pup trailer?

A One hundred twenty-five inches.

* * * *

[24] Q What were the results of those tests?

A The tests revealed that the rollover immunity of the fifty-five foot Michigan double was exceptionally low. The tests confirmed the computerized analyses that showed that the reason for that low level or rollover immunity was that in certain kinds of accident avoidance maneuvers the second trailer or the pup trailer, as we called it, has an ability to amplify the motions that are originally input at the tractor and to make the motions get so large that the most likely event is for the second trailer to try to roll over by itself as we arrive at high enough maneuvering levels.

Q Now, you proposed certain modifications to this fifty-five foot tanker as a result of your tests and what effect did those modifications have?

A They had an effect of significantly improving the overall rollover immunity of the Michigan type double by a factor of two.

* * * *

[28] Q Mr. Ervin, based on the movie and the study that you have done here, would it be reasonable to infer again based on your tests as shown by the Highway Safety Research Institute movie, that a sixty-five foot, five axle, van type double was less safe than a sixty foot, five axle, van type double? Would that be a reasonable inference?

A No.

* * * *

[29] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[39] Q So, it would be logical for someone to extrapolate from your conclusions to van type trailers?

A Yes. There are certainly as long as people obey the rules about, you know, understanding the need to find the equivalent center of gravity heights and otherwise [40] looking at vehicle geometry under a fashion that can account for whatever differences they are talking about.

Q And in effect just as you did in your test study make comparisons to different types of vehicles? I see in your chart you even showed the typical passenger car, for example?

A Yes.

Q Were there any other general principles or principles that could be further extrapolated from your work?

A Well, I don't know.

* * * *

[41] Q Well, the principles of rollover or this oscillatory behavior that you described, could those be generalized to these types of vehicles, particularly, the tank trucks and the doubles or the triples similar to the comparison that you made on page 11 of Exhibit 1-A?

A Yes. Some of them. That is to say I think that a lot of the work that is in the Ad Hoc Study that we did for Michigan produces an understanding of vehicle dynamics that pertains to some of these vehicles while I couldn't say not necessarily all of them. For example, items 14 and 16. It looks like a truck pulling a full trailer. I don't know fully what to think about that yet.

Q What about item 9 which again addresses the question of the van type sixty-five foot double?

A Oh, yes. Certainly there was a number of things about the work that we did that sheds light upon behavior sensitivities that you would expect out of that type of double.

[42] Q And item ten, the triple configuration?

A Yes, but without real substantive proof because we did not in fact add another trailer on the back end of any of the simulation work we did.

Q In fact doesn't a lot of work shed light on the typical tandem axle semi?

A Yes.

* * * *

Q Would you have any opinion as to the relative behavior characteristics between a van and vehicle dynamics between a sixty-five foot double-bottom and a fifty-five foot single or could you comment on the differences between those two vehicles?

MR. LEDERER: Vans or [43] tankers?

BY MR. PAFF, CONTINUING:

Q Vans?

A Are we talking about vehicles that have the same overall height, loaded to the same CG height?

Q Assuming the van type twin is sixty-five foot long with two twenty-eight foot boxes and a ten foot cab and your semi is the same identically, the same height with fifty-five feet in overall length—

MR. LEDERER: How many axles?

BY MR. PAFF, CONTINUING:

Q With five axles on both. I will use the diagram again. Comparing vehicle nine, which they designated as vehicle nine on this chart, and vehicle eleven?

A Yes. You know, the academic community will be fascinated with the things about the double that are generically different from the single. Again what I said, it is capable of different kinds of motions. Of course, everything we are talking about here is of value only in a highway safety context. We're only interested in the motions because we are interested whether they can by themselves degrade vehicle safety or promote [44] vehicle safety and there are two things that are pertinent to the answer of the question. One of them relates to the ability of the vehicle to exhibit a kind of a mechanical behavior that leads to a premature rollover or to some other funny motion that causes it to collide with vehicles or something and in that context I suspect that the dynamic behavior of the sixty-five foot double is probably close enough to the fifty-five foot tractor semi-trailer both in what I would call its yaw motions, its motions back and forth and so on, as well as its overall rollover immunity that I wouldn't venture a guess as to the significance of the difference that may exist there.

Q That certainly may be a pertinent area in which to do some research if one were interested in their character?

A Yes. In fact we are beginning that research this year for the Federal Highway Administration. The second area that is pertinent to the contract of those two vehicles has to do with the overall volume perhaps of the cargo that's carried as relates to vehicle exposure and this was a primary point in our study for the State of Michigan. We believe that you are really not on solid ground if you look only at dynamic behavior and don't [45] do some formalization of your expected safety performance of a given vehicle without taking into account the volume and perhaps also the weight of the commodity that's being hauled in a single vehicle unit, in a single combination and we recommended to Michigan that vehicle volume and vehicle size were not simply exclusively negative quantities from a safety point of view, that since vehicles get in accidents in large measure simply because they are there in the number that they are, they're simply going to get in accidents because they represent targets to get hit, then it makes sense and also rigorous scientific sense to have as few a number of vehicles in service as possible. In that regard we recommend to Michigan the large type tankers of which there are few because they carry so much per combination that they represent an enhanced overall safety performance because of the reduced exposure but that that enhancement must be guarded against whatever price was paid by way of any reduced stability level that may have accompanied the size of the vehicle. But in contrasting a sixty-five foot double with a fifty-five foot tractor semi-trailer, if the volume carrying capacity or somehow the weight carrying [46] capacity of the two, pay load I mean now, is different so as to render one or the other, you know, carrying more commodity per vehicle combination, than there is a factor whose influence on safety needs to be accounted for if you're trying to get an overall safety assessment.

Q I understand what you're saying and in your conclusion in your research I believe it's set forth that that larger Michigan double tanker did reduce the number of trips, so to speak?

A Yes. Right.

Q But you would not be prepared to comment in terms of the number of trips with regard to the operation of twin trailers in Iowa or have done no statistical analysis with regard to that concept, have you?

A No, but there is an axiom. There is a general truth I believe in this issue of exposure and it says that vehicles will get in accidents in proportion to the number which they exist and if steps are taken to reduce the number needed to carry, to do the same mission, to meet the same needs whatever they are, delivery of commodities, then safety will benefit unless there is some tag-along detrimental property that's hidden in the characteristics of the vehicle themselves or in [47] the way they are driven or in the drivers who drive them or something like that * * *

* * * *

You will have more accidents with any kind of traffic volume. Increase the bicycle volume or car volume, any kind of volume, you will have more accidents.

Q And if you use bigger trucks would you be—you talked at one point in your prior testimony about being bigger targets, so to speak, in terms of accidents?

[48] A No. Not bigger targets. Just targets. All these vehicles were ninety-six inches wide in that regard.

Q But well let's say one was sixty foot long and one was sixty-five foot long, the sixty-five foot vehicle of whatever configuration would represent a bigger target in that sense?

A Yes. In that sense for side impact. That wasn't what I meant by the probabilistic issue of exposure but yes the longer the vehicle, it's a bigger target for some potential projectile coming from the side.

Q As well as out of control, it is more apt to hit something or encounter another vehicle?

A Yes. This is, you know, speculative kind of discussion and I'm not really qualified to give that.

* * * *

[55] REDIRECT EXAMINATION

BY MR. VARDA:

Q Mr. Ervin, I think Mr. Paff during his cross examination was trying to suggest that because the Michigan double tanker is much less stable than the Michigan single tanker that a double van type trailer is necessarily much less stable than a van semi, isn't that a false implication? Don't you have to make some determinations as to the center of gravity and other factors before you can make that conclusion?

[56] A Yes.

Q During your cross examination, Mr. Ervin, you discussed what the vehicle's volume carrying capabilities would have on safety. Is it then a fair interpretation that a vehicle that exhibits roughly the same handling and safety characteristics as another vehicle yet carries more volume and could legally carry more volume may have a positive safety effect?

A Yes.

* * * *

[57] Q Now, in cross examination there was some discussion of reliance upon other source materials and we earlier discussed Dr. Jindra's work. Doesn't Dr. Jindra's theoretical work indicate that significant improvement of dynamic stability of vehicle combinations can be made by increasing the wheelbase of the full trailer in a double trailer configuration?

A Yes.

* * * *

[58] RECROSS EXAMINATION

BY MR. PAFF:

Q Just so we are absolutely clear, I believe when you say roughly, you could have a positive safety situation where you have more volume and more cube and fewer trips with roughly the same type of safety in the vehicle, wasn't that your response to the initial question?

A Yes. But there is a trade-off to be made as we talked about with regard to the overall exposure and the overall pay load that has to be balanced when determining where that maximum size might be. Well, there may be a trade-off. It's not clear that there always is a trade-off in which there is this benefit derived from more volume and more cube and necessarily accompanied by some detrimental characteristics. That has to be established. [59] It may be there are no detrimental characteristics or that there are even some beneficial dynamic characteristics. I can't state that generally. I was just trying to say if we want to just talk about the effect of more volume and more cube as it implies reduced number of vehicles to carry the same total quantity of stuff that the result of that particular variable is that it enhances safety categorically.

* * * *

JURAT

* * * *

ERVIN DEPOSITION EXHIBIT 2

Society of Automotive Engineers

Technical Paper Series

781066

Testing the Michigan Double-Bottom Tanker

C.B. Winkler
R.L. Nisonger, and
R.D. Ervin
Highway Safety Research Institute,
The Univ. of Michigan

Truck Meeting
Hyatt Regency, Dearborn, MI
December 11-14, 1978

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.
400 COMMONWEALTH DRIVE
WARRENDALE, PENNSYLVANIA 15096

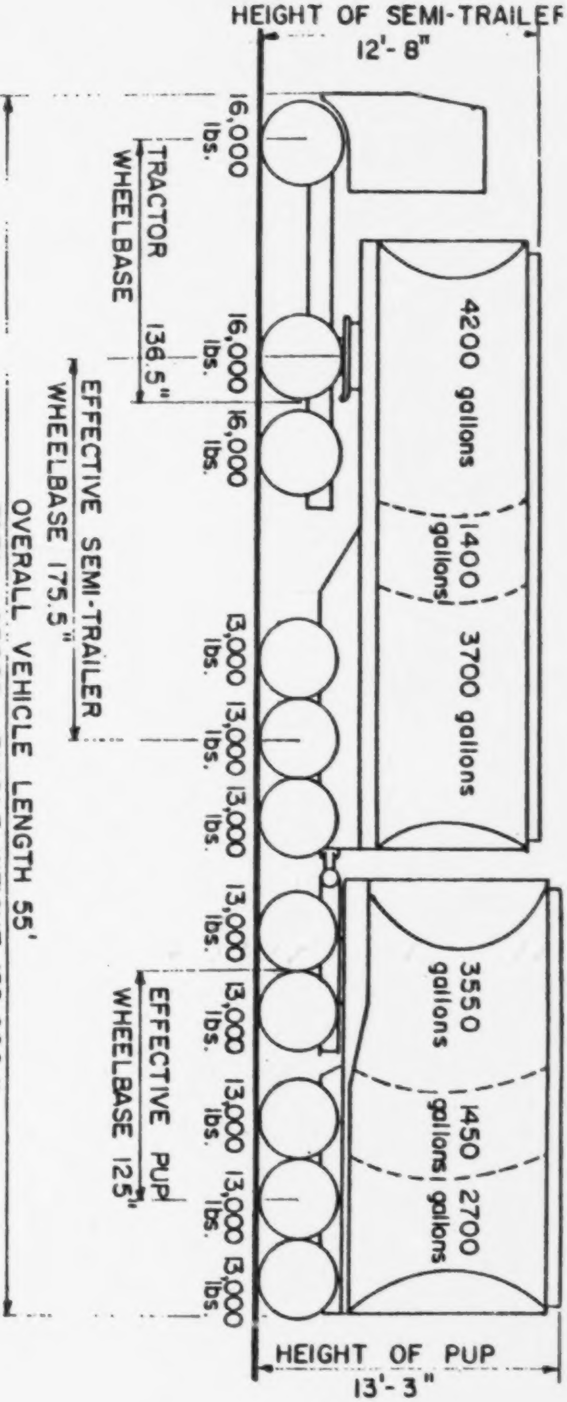
HEIGHT OF SEMI-TRAILER
12'- 8"
4200 gallons
1400 gallons
3700 gallons
3550 gallons
1450 gallons
2700 gallons
16,000 lbs.
16,000 lbs.
16,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
13,000 lbs.
TRACTOR WHEELBASE 136.5"
EFFECTIVE SEMI-TRAILER WHEELBASE 175.5"
EFFECTIVE PUP WHEELBASE 125"
OVERALL VEHICLE LENGTH 55'
TOTAL GROSS VEHICLE WEIGHT 152,000 lb.
HEIGHT OF PUP
13'- 3"

Fig. 2 - Test vehicle configuration

DEPOSITION OF GEORGE TERNENT

Filed May 24, 1979

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

BY MR. VARDA:

* * * *

Q What is your occupation?

A I am a consulting engineer.

* * * *

[4] Q Who did you become employed by?

A Following graduation in 1942, I was employed by the Wright Aeronautical Division of the Curtiss-Wright Corporation in the development of aircraft engines until 1949.

In the period 1949 to 1976, I was employed by the Bendix Westinghouse Automotive Air Brake Company of Elyria, Ohio.

In 19—approximately 1970 that company's name was changed and it became the Heavy Vehicle Division of the Bendix Corporation.

Following 1976, I retired from the Bendix Corporation and started the consulting engineering business.

I might add that during the period with the Bendix Westinghouse organization, a span of 27 years, I held the title of designer, project engineer, chief engineer and manager of engineering.

* * * *

[5] Q What is the business of Bendix Westinghouse?

A Bendix Westinghouse is engaged in the manufacture of air brake—truck air brake systems including the entire—all of the components that make up the truck air brake system.

* * * *

[20] Q What are the differences between the brake system on a twin trailer and the brake system on a semitrailer?

A I am inclined to say there is no fundamental difference; and then in detail I would say the presence of the provision to tow the second trailer is present at the rear of the trailers.

* * * *

[22] Q On the twin trailer, obviously you have some hosing between the first and second trailer and the hosing which carries the supply line or service line. What has been the experience in the reliability of that air transmission hosing?

A Well, the—this is an item which Bendix would have a recommendation on and it would be for periodic inspection of the hoses for signs of chaffing or fraying and replacement if that is noted; and in contrast, the glad hand, of course, the hose is not a metallic device and is subject to change with time.

Q How come in our sudden brake line breaks?

A A key word in your question is, sudden, because the typical failure mode of the hose is to leak and develop an audible hissing sound long before the leakage rate is of any significance in the vehicle braking so sudden hose failures are—that's not the normal mode of failure. Normal mode is developing an increasing leakage.

* * * *

[23] Q What would happen if the supply line between the tractor and first trailer on a twin trailer were to become uncoupled or broken or in some way be disconnected?

A Well, that would vent the line and it would apply the spring brakes on the trailers and dolly.

Q And what would occur if the spring brakes went on in the trailer and dolly?

A There would be a significant retardation and the vehicle would come to a stop.

* * * *

[24] Q Is there any difference between the result you get on a twin trailer as opposed to results you get on a semi-trailer when one of these air lines is broken?

A There is no difference whatsoever when these lines break. Certain events take place on the trailers and they take place on 1 trailer or 2 trailers, depending on which vehicle we're talking about.

* * * *

[42] Q So in order to use the Utica test to evaluate today's braking performance of large commercial vehicles, we would have to look to the values that resulted after modifications were made?

A Well, I think the data both before and after would [43] be of value certainly. And there would be certain merit in studying the initial data because it is the very practical world of the way motor vehicles came out of the factory at that particular time.

Q How did the twin trailers fair as opposed to the 55 foot semi-trailers in stopping distance results?

A Well, as I looked at the numbers, the stopping distance, all I could see was that the stopping distances were identical and the stability during the stops was identical.

Q Where would we find those results in the report?

A Why, page 42 would be the first case in point; and what impressed me here is that the current 50 foot standard of the Bureau Of Motor Carriers Safety where the stopping distance is 50 feet from 20 miles an hour is achieved in the tests; and as a matter of fact, the 35 foot standard of Federal Standard Number 121 is likewise achieved. Values being 32, 35 and 25.

Q Is this to say that in 1967, equipment was available in twin trailers that could meet even today's 121 standards?

A That's exactly what these numbers say.

Q What conclusions can you draw from this test with respect to the braking capabilities of the twin trailer as opposed to the semi-trailer?

A Well, I have to say that the data simply shows that [44] the stopping distance was virtually identical for the 2 types of vehicles.

* * * *

[50] Q What conclusions can you draw out of the Virginia study with respect to the relative braking capability of the twin trailer and the semi-trailer?

A The braking capability of the semi-trailer and the twin trailer are identical, exactly comparable, as is the stability during braking.

* * * *

[55] Q Mr. Ternent, is there any significant practical difference in the transmission times on the air brakes on twin trailers as opposed to semi-trailers?

[56] A Well, I said before that if I had to name a number, I would name five hundredths of a second; and to answer your exact question, I would not call that a significant difference.

* * * *

[57] Q Mr. Ternent, based upon your 27 years of experience with Bendix Westinghouse, your evaluation of performance of twin trailers both theoretical and in practical tests, can you form an opinion as to the relative braking capability of the 65 foot twin trailer in use today and the 55 foot 5 axle semi-trailer in use today?

A In my opinion, the braking capability is identical on both vehicles and the stability which they will demonstrate during braking is exactly equivalent also.

Q Will the twin trailer meet all federal requirements that you're aware of?

[58] A Yes.

* * * *

[130] Q Now, you have testified on cross examination that there are, indeed, more components used in the twin trailer system. What is the practical result of using more components in the twin trailer system with respect to the reliability of the system?

[131] A You used the words, practical result, in your question. And there really is no practical difference in the use of the equipment which has the higher number of components. They simply function and do the job in a comparable manner on both types of the vehicles we're talking about; and I am hanging on the expression, the practical differences.

Q Theoretically, would you expect more difficulty simply because there are more components?

A In a theoretical vein, I think it would be necessary to concede that increasing the number of components increases the opportunity for malfunction.

Q As a practical matter, is this a realistic concern?

A I have never encountered where it was a matter of real concern.

* * * *

JURAT

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DEPOSITION OF ARCHIE H. EASTON

Filed May 29, 1979

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

BY MR. VARDA:

Q Now, I referred to you earlier as Professor Easton. Are you, in fact, a professor?

A Yes. I'm still considered a professor, although I have retired from the University. I retired October 1, 1977. [4] But I was fortunate enough to achieve emeritus professorship and this means that you are always a professor even though you are not actively teaching.

Q What is your current occupation?

A I am a professional engineer with Safety Engineering Associates, Incorporated, here in Madison.

Q And what is Safety Engineering Associates, Incorporated?

A Safety Engineering Associates is a consulting engineering firm which deals with accident reconstructions of ground vehicles and also product liabilities.

Q Did you testify previously in the case captioned Raymond versus Rice, over the length of double bottom trucks in the State of Wisconsin?

A Yes, I did.

* * * *

[5] Q In the course of your studies and your professorialship in automotive engineering have you had occasion to review large articulated commercial vehicles as well?

A Yes. The first work that I did at the University dealt with straight trucks and tractor semitrailer units. Then, in addition to that since 1974 I have been associated with the National Safety Council and for 13 years I was chairman of the Committee on Winter Driving Hazards and in that work we dealt with tractor semi-trailer units.

* * * *

[6] Q Professor Easton, in your work as a Professor of [7] Mechanical Engineering at the University of Wisconsin, in your work as a Highway Safety Engineer have you had the opportunity to study various large commercial motor trucks?

A Yes.

Q Have you had an occasion to study what is commonly known as a 65-foot twin trailer?

A Yes.

Q When I refer to twin trailers, hereafter can we agree that I am referring to the 65-foot twin trailer for all purposes here?

A Yes.

Q Have you had an occasion to study the 55-foot semi trailer?

A Yes.

* * * *

[9] Q Professor Easton, have you ever had an occasion to be involved in vehicle testing of twin-trailers?

A Yes.

Q Have you ever been involved with vehicle testing of semitrailers?

A Yes.

[10] Q Professor Easton, as a result of your work as an automobile and truck engineer, your experience in the testing of large commercial vehicles such as twin trailers and semi trailers and your knowledge of highway safety problems, have you been able to form an opinion as to the relative safety of the 65-foot twin trailers as opposed to the 55-foot semi trailer?

A Yes, I have.

Q What is that opinion?

A That opinion is that they are comparable in safety.

* * * *

Q What is the Winter Driving Hazard Committee of the National Safety Council?

A Winter Driving Hazard Committee was set up in 1939 under Professor Moyer of Iowa State at Ames to study items that might promote safety in winter driving. This would include various types of vehicle tires and special devices. That committee has continued as a National Safety Council Committee for up until the present and [11] it is still going.

It is composed of people from insurance companies, trucking companies, trucking associations, automobile companies, chain manufacturers, representatives of salt or additives for the highway, quite a complete coverage of the winter or adverse safety driving field. And having been chairman of the committee for several years, many of the people have very opposing viewpoints and so it is sort of a wonder that this committee has stayed together as long as it has with these opposing viewpoints, but nevertheless, it has promoted a great deal of safety in winter driving.

Q Would firms or participants of the American Automobile Association be involved in this committee?

A Yes.

Q Has the Committee on Winter Driving Hazards ever had occasion to test trucks including semis and doubles?

A Yes, it has.

Q Has this happened on more than one occasion?

A Yes. I summarized it on Page 1, "In 1951 the National Safety Council initiated tests on jackknifing of truck-tractor semi trailer combinations on ice. Further tests were conducted in 1952, 1953, 1954, 1955, 1958, 1960, 1964, 1965, 1968, 1969, 1970, and 1971," and this [12] last year there were tests on tractors particularly on tractors and this type of driving.

Q Could you give some examples of what aspects of these semi trailers you might test for?

A Some of the earlier tests were involved in methods of application of brakes, sort of a forerunner of MVS-121. Early in the committee's experience it was found that if the wheels could be kept rolling and not break traction that the vehicle would be stable and so after that every effort was made to try to devise methods to keep the wheels rolling and so anti-lock braking was one of these methods. And then just generally braking, how long or how many feet does it take for various types of vehicles to stop when they are loaded and when they are unloaded and how does it compare with automobiles; how do they stay within a 12-foot lane.

Then there were also tests involving anti-jackknife equipment to determine if this type of equipment would be useful to a driver on the highway.

* * * *

[15] Q Now, stepping back to the various tests of the Winter Driving Hazards Committee, has that committee ever had an occasion to test the braking performance of twin trailers?

A Yes.

Q Where were those tests performed?

A Those were performed at Stevens Point and our results of which are shown in the 1968 Winter Test Report.

* * * *

[20] Q What was the surface that these tests were performed on?

[21] A These were glare ice. Well, swept snow.

* * * *

[35] Q And how would you compare the 55-foot semi to the 65-foot [36] twin-trailer in their relative ability to stop on these two tracks?

A I believe we would have to go back to those tables, but in general where the temperature conditions were the same the twin-trailer stopped in slightly less distance than did the semitrailer.

Q And how would the twin-trailer then compare to the 55-foot semitrailer?

A It would be in the same order of magnitude.

* * * *

[38] Q As a result of your experience with testing these large [39] commercial vehicles, including double bottoms and semis are you able to form an opinion with respect to the relative ability of the 55-foot semi and the 65-foot twin-trailers to stop on icy road conditions, whether it be a curve or a straight stopping course?

A Yes. They are both capable of stopping under these conditions and staying within a 12-foot lane, so that they don't interfere with traffic in other lanes.

* * * *

[41] Q Professor Easton, in your experience with respect to reconstruction work, what factors have you found to be most relevant to the severity of an accident?

A Generally speed. The more speed the more energy there [42] is in the vehicle and the more that has to be absorbed either in the crushing of the vehicle or damaging fixed objects, so the severity is treated proportionate to the energy of the vehicle.

Q What factors do you use to determine the energy of a vehicle?

A The weight of the vehicle and the velocity.

Q Is there a mathematical formula for determining the total effect of these factors and the energy of a given vehicle?

A Yes. The general equation for kenetic energy is mass times the velocity squared over the gravity factor. For vehicle use when velocity is for four miles per hour we have reduced it to the weight of the vehicle times the velocity in miles per hour squared divided by the constant 30.

Q Does the length of the vehicle have any significance to the severity of an impact?

A Very little, if any. It is the energy involved in the vehicle.

Q In other words, there is no component for length in that calculation?

A No.

* * * *

[53] CROSS-EXAMINATION

BY MR. PAFF:

* * * *

[63] Q Now, what prompted the paper [Jackknifing of Articulated Vehicles on Slippery Surfaces] in 1972? Is that anything to do with the first lawsuit? [Raymond v. Rice]

A No.

MR. VARDA: Counsel, I might point out that the first lawsuit was initiated in 1975.

Q Did you have any contact with any member of this law firm regarding this particular paper?

A No. I think it arose—I remember there was a lot of [64] discussions at that time on jackknifing and so as a faculty member and someone interested in safety and since no one else seemed to be doing it I set down what I thought were the elements of jackknifing.

Q And where was that paper presented then?

A Well, it wasn't presented. It was just—I gave copies of it to the Safety Council and it never was presented.

* * * *

[65] Q So what you did with regard to Exhibit 7 is extrapolate several tables that you developed in 1968 and wrote some general comments relating to it?

A Yes. That is right, and the extrapolation was mainly between the lengths of the tractor and the work that we had done—we had done work in the truck research project four-wheel drive provided two or three different tractor lengths and we put them on the circle and measured this to 15 degrees and we found that the longer the tractor, the greater time it took to develop the 15 degrees, but the greater also was the time required to come out of the jackknife if you were able to come out of it, so we decided or I decided from that that the length of the tractor was, as far as danger or jackknife potential was concerned, was about the same. It didn't have any effect.

* * * *

[66] Q Now, this report was a test, really, of triple bottoms, was it not?

A Yes.

Q And essentially the 2-S1 type of vehicle was a broken down triple into the first component, was it not?

A The first two components, the tractor and the semi.

Q So when you are saying the semitrailer, you are really talking about a half of a double combination as far as the trailer goes?

A Yes.

Q Or a third of a triples combination as far as the trailer goes?

A Yes.

* * * *

[84] A That is right. We actually tested long and short wheel based tractors.

Q But you didn't specifically test the 2-S1 vehicle and the 3-S2 vehicle, did you?

A No.

Q Now, sticking with the tractor, the essential difference or the essential data to get to the 15 degrees is the function of the length of the trailer?

A No.

Q What is the function of the length?

[85] A It is the function of the length of the tractor because we tested these long and short wheel base tractors on the same trailer and the trailer never moved out of its normal direction of travel, but the tractor, we would apply more power and we would spin the wheels on the tractor drive wheels and it would start to go into this, up to 15 degrees, and the same on the short wheel base tractor, and we compared the times and also the times to get out and although it didn't take as long for the short wheel base tractor to get into 15 degrees it could come out quicker because of the shorter wheel base and likewise the longer wheel base tractor wouldn't go into the 15 degrees in as short a time, but it took, on the other hand, it took longer to get out of this situation. But here we are down now to a relative little difference in wheel base, not anywhere near what we were doing in the extremes.

Q Right. But so I understand you, the propensity to jackknife might be greater with the shorter wheel base tractor, but you are saying it is more maneuverable so you can pull out of it quicker?

A Right.

Q The propensity to jackknife for a longer wheel based tractor would be less, but it would take you longer to [86] correct for the jackknife once it occurred?

A That is a very good statement.

* * * *

[88] Q Now, your testimony—have you ever testified in court or in any of your accident reconstructions, that a second and a half might have been a critical time between the occurrence of an accident and the non-occurrence of an accident?

A I think there is a three-second or four-second emergency rule in this state but this certainly—the second and a half is certainly a critical factor. Three-quarters of a second in some instances could be a critical factor. It might mean a difference between getting brakes on and brakes off—or brakes on, but in this particular instance where cars are passing another vehicle and there is very little chance for anything—where there isn't any chance for anything coming in the opposite [89] direction, I wouldn't think that would apply.

* * * *

JURAT

* * * *

EASTON DEPOSITION EXHIBIT 7

REPORT ON JACKKNIFING OF ARTICULATED VEHICLES ON SLIPPERY SURFACES

FEBRUARY 1, 1972

BY
ARCHIE H. EASTON

REGISTERED PROFESSIONAL ENGINEER
IN THE
STATE OF WISCONSIN
AND
PROFESSOR OF CIVIL AND MECHANICAL ENGINEERING
THE UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN

*

* This report is the opinion of an individual and not that of the University of Wisconsin or the National Safety Council.

INTRODUCTION

In 1946, a project was initiated at the University of Wisconsin by the FWD Corporation to study the performance, stability and economy of front, rear and four-wheel drive vehicles. This project included articulated vehicles, particularly truck-tractor semitrailer units on ice.[a]

In 1951[b], the National Safety Council initiated tests on jackknifing of truck-tractor semitrailer combinations on ice. Further tests were conducted in 1952, 1953, 1954, 1955, 1958, 1960, 1964, 1965, 1968[c], 1969, 1970 and 1971. The year of 1968 was concerned with the behavior and control of 65-ft. twin-trailer combinations. This report is based on experience gained as a participant in the tests listed above or as a member of the Committee on Winter Driving hazards since 1947. The purpose of the report is to provide information to those concerned with the safe operation of motor vehicles.

The jackknifing of truck-tractor semitrailers or any articulated vehicle may be divided into two classes:

1. *Tractor Jackknifing*—This condition exists when the tractor goes out of control and swings around against the trailer. It is the most dangerous form of jackknifing

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[a] Performance Studies of Straight Trucks and Truck-Tractor Semitrailer Units, A. H. Easton, Engineering Experiment Station, University of Wisconsin, Report No. 6, July 1, 1954, Chapter V.

[b] Resume of Tests of Commercial Vehicles on Winter Surfaces, 1939-1966, National Safety Council, Committee on Winter Driving Hazards, Chicago, Ill.

[c] 1968 Winter Test Report, National Safety Council, Chicago, Ill.

because the steering unit or tractor is no longer capable of directing the course of the entire vehicle. The semi-trailer is only out of control because the king pin which connects it to the tractor is out of control.

The causes of tractor jackknifing are loss of traction at the tractor drive wheels, either due to braking or application of power with the front or steering wheels of the tractor continuing to roll. The rolling front wheels are capable of taking side forces, but the drive wheels are not, thus they will slide sideways pivoting about the steering wheels causing jackknife. Another cause of tractor jackknife is when the tractor with e.g. the left side on dry pavement and the right side on ice and the brakes are applied hard. The wheels on the right will slide first, causing the tractor to swing hard to the left, resulting in a tractor jackknife. Except striking or being struck by other objects, these are the fundamental reasons for tractor jackknifing.

If a driver senses an impending jackknife, by the time it reaches an angle of 15 degrees, he may still have an opportunity to recover if there is ample room for maneuvering. In terms of time, he must react in 1.5 to 2.5 seconds.

2. *Trailer jackknifing*—This type of jackknifing is attained when the tractor remains in control but the trailer swings out of alignment with the tractor. This form does not occur as frequently as tractor jackknife nor is it potentially as hazardous because the tractor is still capable of being directed. The cause of trailer jackknife is loss of traction at the trailer wheels which can be obtained from a brake application. An example is a situation in which the trailer wheels are locked on a crowded street; the trailer then swings toward the curb and the tractor continues to travel just to the right of the centerline on the original path.

DISCUSSION

In order to make a comparison of the tendency of the 55-ft. tractor semitrailer combination and the 65-ft. twin-trailer combination, consider first the tendency of the 55-ft. tractor semitrailer combination and the 35-ft. tractor and semitrailer of the 65-ft. combination. The data show that the shorter tractor of the 35-ft. combination would reach an angle of 15 degrees in a shorter time but time required to recover with the shorter wheelbase tractor is less so that the relative safety of the two units remains the same. Adding the second trailer to the 35-ft. tractor-trailer does not materially effect the jackknifing tendency between the tractor and the first trailer because it is a function of the load on the front wheels of the tractor. Thus where tractor jackknifing is concerned, there is no significant difference between the 55 and 65-ft. units on an ice surface, which represents the most probable situation in which tractor jackknifing will occur.

Having established the relative safety of the 55-ft, 73,000 lb., and 35-ft., 41,000 lb., combinations, the next step is to refer to Table I attached of the 1968 Winter Test Report of the National Council by the Committee on Winter Driving Hazards. This table compares a 35-ft., 39,660 lb., tractor semitrailer shown as 2-S1 and a 65-ft., 69,140 lb., twin-trailer combination shown as 2-S1-2. On the straight course, the stopping distance of the twin-trailer combination is shorter with the front wheel brakes acting on both units and with the temperature at 32° F. In each case, under the heading control is "yes" which means that each of the combinations stopped within the 12-ft. lane.

Examining the Curve Course of Table I, stopping distances are much greater for the twin-trailer combination, but there is a significant difference in temperature where 32° F. is the most unfavorable.

Referring to Table II attached, in this series of tests, the front wheel brakes on the tractor were reduced in effectiveness by the front wheel limiting valve. Here again the twin-trailer combination stops in a shorter distance on the straight away with favorable 20° F. temperature differences and a longer distance on the Curve Course with an unfavorable temperature difference of 12° F. Under control, the answer is "Yes" except for the twin-trailer combination on the Curve Course where the description is "marginal." Reference to the text shows that this combination deviated from the 12-ft. lane in the last few feet of the stop. Tables III and IV show no reason to believe that the safety of the two combinations is significantly different.

CONCLUSION

The general conclusion then is that the safety of the 55-ft. tractor semitrailer and the 65-ft. twin-trailer combinations is not significantly different.

DEPOSITION OF CHARLES J. CALVIN

Filed April 16, 1979

[Caption Omitted in Printing]

*   *   *   *

EXHIBIT 2

T T M A
Recommended Practice

RP No. 15–77

April 5, 1977

TRUCK TRAILER
MANUFACTURERS ASSOCIATION

2430 Pennsylvania Ave., N.W.
Washington, D.C. 20037
Telephone (202) 785-5833

CHARLES J. CALVIN
President

SUBJECT **DIMENSIONS AFFECTING INTERCHANGE OF 96-in. and 102-in. WIDE DOUBLES TRAILERS**

(Original issue date - June 1967) (Includes information contained in RP No. 31)

1.0 PREFACE:

1.1 Recommended practices or technical bulletins furnished by TTMA are a guide to general practice and the state of the art that exists at the time of their inception. They are not exhaustive. TTMA cannot possibly know, evaluate or advise the service trade of all conceivable ways which a practice or bulletin might be used or possible consequence of each way. TTMA has not undertaken any such broad evaluation.

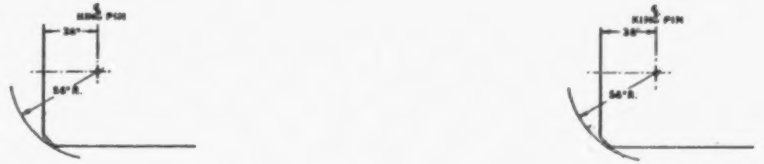
1.2 Everyone, who uses practices or bulletins, either recommended or not recommended by TTMA, must first satisfy himself thoroughly that neither his safety nor the safety of his product will be jeopardized by any method he selects.

2.0 SCOPE AND OBJECTIVE:

2.1 To provide guidance for operators and manufacturers in ordering and designing doubles trailers which may be interchanged with other similar equipment and the total combination operate satisfactorily and legally within a 65-ft. overall length limitation. This recommended practice does not apply to tandem dolly applications.

4/5/77 RP No. 15–77

DOUBLES TRAILER DIMENSIONS FOR INTERCHANGE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36"
56" R.
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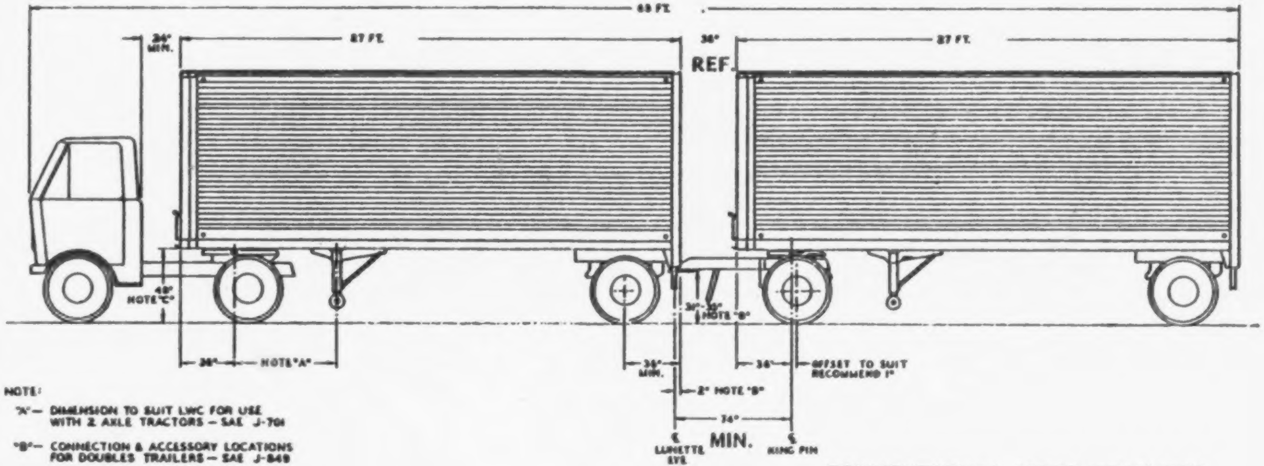

65 FT.
24" MIN.
27 FT.
36" REF.
27 FT.
48" NOTE "C"
36" NOTE "A"
36" MIN.
30"-32" NOTE "B"
2" NOTE "B"
36"
OFFSET TO SUIT RECOMMEND 1"
74" MIN.
℄ LUNETTE EYE
℄ KING PIN

NOTE:

"A"— DIMENSION TO SUIT LWC FOR USE WITH 2 AXLE TRACTORS – SAE J-701

"B"— CONNECTION & ACCESSORY LOCATIONS FOR DOUBLES TRAILERS – SAE J-849

"C"— REFER TO SAE J-701 FOR APPLICABLE 5TH WHEEL HEIGHT DEFINITIONS

"D"— EACH TRAILER SHOULD BE EQUIPPED TO SERVE AS THE TOWING TRAILER

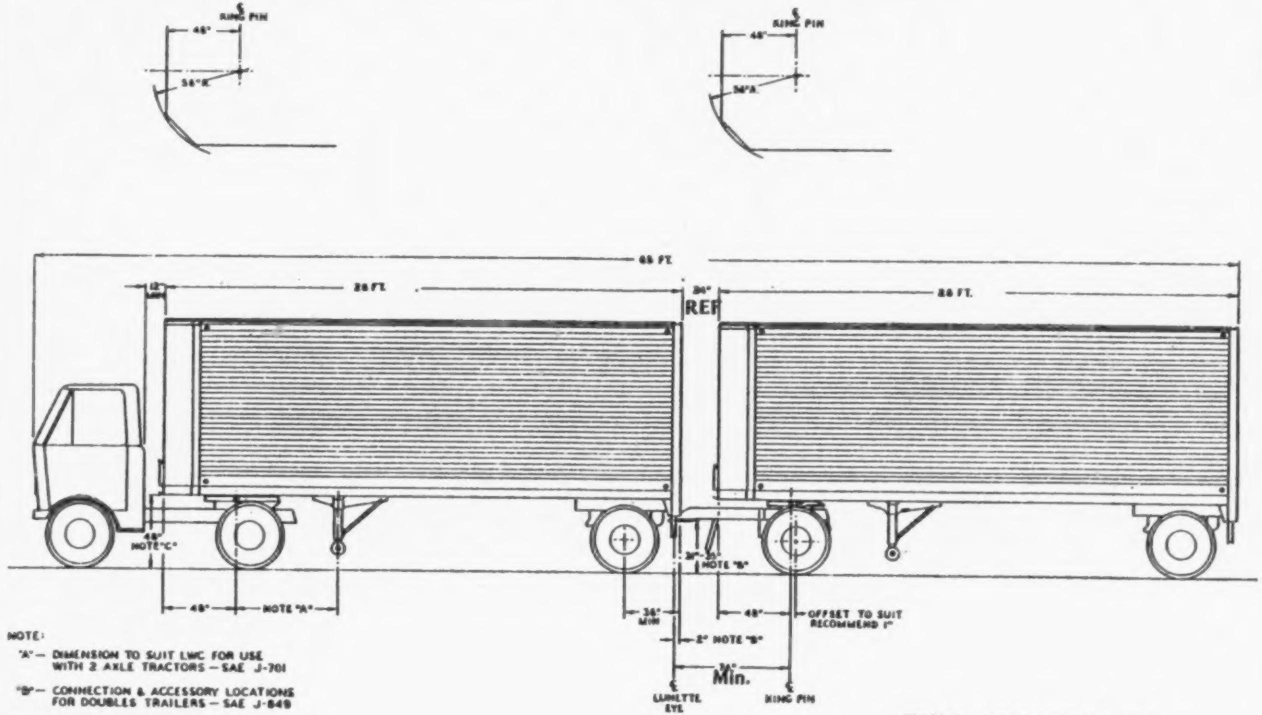
CONVENTIONAL NOSE TRAILERS

TTMA RECOMMENDED PRACTICE

DOUBLES TRAILER COUPLED DIMENSIONS

SHEET 1 OF 2

4/5/77 DOUBLES TRAILER DIMENSIONS FOR INTERCHANGE RP No. 15–77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48"
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12"
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REF
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36"
MIN
2" NOTE "B"
48"
OFFSET TO SUIT
RECOMMEND 1"
36"
Min.
℄
LUNETTE
EYE
℄
KING PIN

NOTE:

"A"— DIMENSION TO SUIT LWC FOR USE WITH 2 AXLE TRACTORS — SAE J-701

"B"— CONNECTION & ACCESSORY LOCATIONS FOR DOUBLES TRAILERS — SAE J-849

"C"— REFER TO SAE J-701 FOR APPLICABLE 5TH WHEEL HEIGHT DEFINITIONS

"D" EACH TRAILER SHOULD BE EQUIPPED TO SERVE AS THE TOWING TRAILER

BULL NOSE TRAILERS

TTMA RECOMMENDED PRACTICE

DOUBLES TRAILER COUPLED DIMENSIONS

SHEET 2 OF 2

DEPOSITION OF ANDREW HAPPER

Filed June 4, 1979

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

BY MR. VARDA:

* * * *

Q And by whom are you employed?

[4] A I am employed by the Middlewest Motor Freight Bureau.

* * * *

[5] Q Can you describe, and perhaps give us some examples which you would have with actual motor carrier operations as a result of your employment with Middlewest Motor Freight Bureau?

A Yes, sir. As my qualifications spell out, specifically on page three in the second paragraph, I appear before the regulatory agencies of the Federal government, the Interstate Commerce Commission and the regulatory agencies in some 12 states in the Middle West.

* * * *

[6] Q Now, these carriers that you deal with basically regular route, general commodity carriers, regulated by the Interstate Commerce Commission and the various state commissions?

A That is correct, sir.

* * * *

[10] Q Can you indicate the principal categories of service in which that labor expense would be incurred?

A Well, labor expense, of course, is spread throughout—there are four units of service, as I explained in Exhibit 1, line haul, pickup and delivery, platform handling, and billing and collecting. Line haul expense, approximately 50 percent of total expense for line haul service represents labor. [11] Pickup and delivery, it increases to approximately 78 percent, and platform expense is over 80, about 82 percent, and billing and collecting cost represents somewhere around 40 percent. So the principal place where labor is a greater portion of total expense is in pickup and delivery service and platform handling.

* * * *

[20] Q * * * [21] What I would like you to do is indicate how the type of cost—added cost that Mr. Wrightson has estimated would affect the rate making procedure of the MC-82 type, which you have just described.

A All right. To the extent that—we're speaking now, specifically of Consolidated Freightways. To the extent that Consolidated Freightways incurs additional expense, it's included in its annual report. To the extent it's included in its annual report, it finds its way into the costing of its traffic which goes into the MC-82 presentation, not only of the Middlewest Motor Freight Bureau, but some six other bureaus, five other bureaus. These added costs, of course, result in inflating, if you care to phrase it that way, inflating the cost in connection with specific services, which reflects in the total expenses involved, which affects the operating ratio on the traffic, and if there are added costs, it increases the operating ratio.

[22] Q Are these costs—can you explain how these costs are apread and how they would impact tariff publications by bureaus other than Middlewest?

A All right. They impact all of the tariffs which we publish, obviously. They impact tariffs of every bureau in which Consolidated Freightways participates and is a frame carrier, and they are a frame carrier in five other bureaus, so all the costs, the additional cost of one locality, if you—assuming the truth of this, would be spread from Miami, Florida, to Portland, Oregon, from San

Diego, California, to Boston, Maine—Massachusetts, Portland, Maine. Every bureau would have a somewhat higher cost as a result of these added costs.

Q Would these added costs in the—under Middlewest Bureau of Tariffs, for example, affect the rates of a shipper moving a shipment from Kansas City, Kansas, to St. Louis, Missouri?

A Yes.

Q And would that effect be an increase in some way the rates paid by that shipper on that type of movement?
[23] A Yes, it would.

* * * *

[25] Q In the event that Mr. Wrightson were correct in his estimation of added cost arising from exclusion of standard twins from interstate highways in Iowa, and that exclusion and those costs were eliminated, what effect would there be in the subsequent general increase proceedings under the MC-82 type rate making?

A Well, it would improve the productivity. It would reduce the amount of cost increases that are experienced by Consolidated Freightways and by other carriers, which would utilize standard twin [26] operation across the State of Iowa. To the extent that it ameliorates the amount of increase in their expenses, it would have a positive effect, reducing effect, upon the amount of increase the carriers would have to seek from the Interstate Commerce Commission in connection with their general rate structure.

* * * *

[28] Q Now, would the dollars saved, if Mr. Wrightson is correct, by C. F. be directly passed on by C. F. to the public?

* * * *

A If—I can put it very simply. If C. F. realizes a savings in its expense, the savings will be passed on to the rate payer in the form of a reduced amount of increase at a subsequent time, which would reflect this savings.

Q Would that mean that C. F. would pass on, dollar for dollar, the savings which it would obtain?

* * * *

[29] A I can't say for certain it would be a dollar for dollar basis, and it certainly wouldn't be in the immediate period subsequent to the effectuation of a savings. It would show up as soon as 110 or a 120 days, and it would, of course, be reflected in subsequent time periods, since its cost would be reduced, and those all go inot the total cost which make up the rate based upon which the carriers publish their rates.

* * * *

[32] Q In the rate making, which you have just described, is there any means by which the cost projected by Mr. Wrightson can be attributed to the shippers, and only those shippers, who are moving the affected traffic?

A Traffic to and from the State of Iowa?

Q Let's see. Traffic that incurs added cost as a result of moving around Iowa?

A No.

* * * *

[40] Q Now, coming back to Mr. Wrightson's projections, his variability factor is, as calculated on Appendix A, would amount to approximately 82 percent?

A I would consider that low.

Q All right. Would that tend to understate cost projections predicated on it?

A That would tend to understate the variable portion of his total expense, and any calculation based on that would be understated.

* * * *

[62] Q Now, if you would look again at Exhibits 2 and 3 together, can you specifically point out the relationship of platform handling costs as between the—

comparing the two carriers, C. F. and the Roadway/ Western Gillette combined?

A Yes, I can. If you would refer to Exhibit No. 2, and to the column which is under "unit cost base", the very bottom figure, 105.206, that's cents per 100 pounds, is the platform cost in the year 1977 for Consolidated Freightways. Referring to Exhibit 3, the same place, you can see that for Roadway Express/Western Gillete general commodity, the 1977 unit cost for platform handling was 124.818 cents per 100 pounds. Updating it to the April 1, 1979, or projected April 1, 1979, level, Consolidated Freightways platform handling cost is 134. 697 cents. Roadway Express is 151.656 cents per hundred weight.

Q Is this consistent with your observation of the relationship between platform handling and average [63] length of haul?

A No. I would have expected that Roadway, having a lesser length of haul, would have had a slightly less platform handling cost, because of the less miles transported and the less probability of intermediate platform handling.

Q Do these unit costs in any way reflect the overall incurrence of platform handling?

A Yes.

Q Can you explain how?

A Well, basically, in determining platform cost, we take the total expense incurred for platform handling service, cargo handling service, and we divide it by the pounds given platform handling. Obviously, Consolidated Freightways has arrived at some method of reducing its platform handling costs.

Q Well, now, is that a—you say a method of reducing its platform handling cost, may that involve—that method involve avoidance of platform handling?

A That's, in all probability, knowing as I do the type of operation they conduct, I would say that, [64] to a great extent, it's the ability to avoid the intermediate platforming by the utilization of twin trailers.

* * * *

[66] CROSS-EXAMINATION

BY MR. PAFF:

Q Mr. Happer, could you describe how the Motor Carrier Bureau, by which you're employed, is [67] financed?

A Totally by the carriers. They are assessed dues which are prorated based on their revenues earned or which could be earned from rates which the Middlewest Motor Freight Bureau publishes. If I may explain that a little more, we publish intrastate rates in the State of Iowa in our Tariff 303. Should a carrier, on his own desire, maintain an individual tariff for application in Iowa intrastate commerce, he still pays dues as if we published his intrastate rates. Also, the carriers are assessed supplemental fees which cover the cost of publication of supplements.

* * * *

Q Is it a fair statement, then, to say that the more revenue you would generate for a particular carrier, the more the income of the freight bureau would be?

[68] A That's right. A large carrier would pay a greater monthly dues than a small carrier. Our smallest carrier pays $25 a year.

* * * *

[76] Q Now, with regard to the cost we're talking about in picking out that same line-haul cost, could you give me the total line haul-cost expense for all the carriers who are members of the bureau as of this date?

A I don't know if I can give it to you for all of them. I can give it to you for the 111 which constitute our frame.

Q That would be fine.

A The total line haul-cost—now, this is system wide, you understand—$3,622,932,151. That's on the April 1, 1979 expense level.

Q Okay. Can you give that to me again?

A Yes, $3,622,932,151.

Q Okay. So in essence, wouldn't we be comparing the two million dollars, assuming that figure is correct, to that total number, in terms of the impact of that?

A No, I wouldn't.

Q You wouldn't?

A I certainly wouldn't, no. Do you want me to explain why?

[77] Q Why not?

A To the extent that these other carriers, which are included in this 111, conduct operations through the State of Iowa in the transportation of commodities, if they are faced with the same situation of rounding, running around the State of Iowa, they incur additional expense there, and that would go, so that two million would be against Consolidated. To the extent the carriers incur additional expense you would have to compute that expense and reduce it, the line-haul cost for all the carriers.

Q But to the extent that somebody was not incurring that expense of Iowa by operating within the current length limitations, they would not incur that expense, is that correct, and that fact would be, too, reflected in the historic rate-making procedures that the bureau has done, would it not?

A If they don't incur the expense, certainly there's no reduction against the total expense. If they do incur it or if they would incur it, if it would result in increased productivity, it would be incurred, [78] it would be a reduction against total expense. At this time I can't tell you how many carriers do or don't do it.

Q So, in fact, there's no way to quantify this two million dollars in terms of its effect on rating, is there not—or is there?

A No, it would have an effect. Now, just what the measure of that effect is I can't quantify, that's right.

Q Did you attempt to quantify in terms of the Wisconsin situation deducting two million dollars from the line-haul cost as asserted there and work that through to a conclusion to discover what savings, if any, were passed upon to shippers under the new rate system?

A No, I have not done so.

* * * *

[82] Q So, in effect, putting this two million dollar cost figure over the total operating revenues of C. F. or the line haul cost portion, both of those figures, if we did that, and tried to make some analogy between the error factor in your calculations in the traffic court, they would both be of the same magnitude, would they not?

A Approximately, yes.

Q In fact, they would fall within the area that could be attributed essentially to sampling error, could they not, according to your own publication?

A No, the sampling error has to do with revenues. The two million has to do with expense. There's no [83] error on expenses, unless the error's made in the annual report of the carrier, but there is no error in connection with expense.

Q But you do not go back and verify the actual expenses as submitted to you in the report?

A That annual report, if you'll notice, is notarized and subject to audit, and those annual reports are filed after audits in the—in connection with the size of C. F., carriers of that size, after they've been audited by an outside accounting firm.

Q Yes, but you don't go back to the carrier and see that those costs are correct, you accept those costs as accurate from whatever carrier you're dealing with?

A Unless there is some obvious error, then we go back to them. I do, I have gone back.

Q Right.

A I've gone to carriers and examined their books.

Q Would you go back when you felt that there was an error in excess of two million dollars?

A Certainly.

* * * *

[93] Q (By Mr. Paff) Mr. Happer, would the effect of this two million dollars in additional cost, or cost that would not be incurred, have you attempted to make any calculation on your own part by deducting two million dollars from last year's operating [94] expenses and making a calculation as to its effect upon the rates or a tariff that might be published by your bureau?

A No, I haven't. I haven't made any such calculation.

Q Would that be an impossible task?

A No, I could, by using my computer, I could reduce his expenses by two million dollars, come up with different ratios, but I'd have to go back to base year to do it, to make it accurate, and then update from that basis.

Q What would the magniture, in your humble opinion, be with regard to the magnitude of the difference we might talk about?

A It wouldn't be good, I can say that. I haven't any idea what the magnitude—since I haven't made a measurement, I'd be foolish to make a conjecture as to it.

Q Would it be fair to say that it would be less than one percent?

A I would say yes, for Consolidated and on the total. How many more involved, I don't know.

Q In fact, it might even be insignificant?

[95] A Well, I don't want to get in semantics. I don't know. Insignificant—two million dollars is not an insignificant figure, basically. In toto on the total operating expense, and considering the total miles operated, it wouldn't be of a great magnitude, I could say that safely.

Q Less than one percent of the total?

A I would think, yes.

Q In fact, probably less than half a percent of the total influence?

A Not—on the total influence of 111 carriers?

Q Speaking with regard to the rate making structure and the combination of 111 carriers, which make up your collection of cost data, it would certainly, you know, your number's getting bigger that you're dividing by, so it would become less significant, wouldn't it?

A Well, if I were going to make an assumption, first of all, I'd have to take all the carriers which operated through the State of Iowa which would benefit by the operation of standard doubles. Secondly, I'd have to go to the other states which [96] have such prohibition against the use of standard doubles, or prohibition against anything in excess of 55 foot length, which some states still maintain archaic laws. If you were to make all these corrections, I don't think it would be insignificant the effect upon the total rate making over a period of time.

(Off the record.)

Q (By Mr. Paff) State regulation of any kind, whether it's limiting the length of vehicles to 55 foot vehicles when 120 foot vehicles could be used, would have an effect upon the rate as you see it, would that be fair to say?

A Certainly, it has an effect.

* * * *

[100] Q Now, with regard to these managerial decisions, with regard to the use of equipment and platforming and establishing the relay points, do those affect [101] the costs as reflected in these exhibits that you've talked about here today?

A Certainly do.

* * * *

Q Now, that has nothing at all to do with whether one state has 55 feet or another state has 110 feet?

A Certainly it does.

Q It does?

A Sure.

* * * *

[104] Q So if you can get more revenue, you can increase your operating ratio?

A That's exactly right. If I can utilize larger cube to put more revenue on one vehicle, I get more revenue.

Q Same with additional weight and additional space, if you're hauling those type of commodities?

A That's right.

Q So there's a constant pressure in terms of pushing back those limits with regard to length and weight?

A That's right. There's a constant pressure motivated by the, first of all, productivity, secondly, holding down costs.

Q I believe it was your testimony that there would be 110 or 120 days time lag, assuming certain costs would be reduced to Consolidated Freightways?

[105] A Yes, that's assuming—going through this updating program, because I do use the most readily available—the most recent available quarterly report, and to process it and everything else takes about 30 days to get it into determination of the update factor to apply, so that would be approximately 90 days for a quarter and an additional 30 days process.

A Wouldn't the immediate short-term effect of the elimination of the Iowa statute be immediately realized to Consolidated Freightways in short-term profit?

A Oh, they'd experience profit, certainly.

Q Uh-huh. And, in fact, that profit—

A Well, let's not say that. I can't say that for certain. They would experience a lessening of their expenses. Now, if that returns a profit, if that results in a profit, then there would be an increase in profit, yes. All things being equal, they continue to transport and all that, yes, it would be an improvement.

Q In fact, before the expenses that they would [106] theoretically be savings as a result of the elimination of the ban would be reflected in rate making, it would be a period of at least 120 days, is that correct?

A That's right.

* * * *

[111] Q And you don't mean to imply from your testimony that due to a certain operational decision with regard to Consolidated Freightways, and Roadway and Western Gillette on the other, has any bearing upon those costs as you've outlined them in Exhibits 2 and 3?

A No, my statement, Mr. Paff, was to the extent that Consolidated Freightways was capable of avoiding intermediate platform handling, as reflected in its lower platform handling cost. I believe that to be true.

Q Now, the same economy is there—are you directing that specifically toward the use of doubles?

A Yes, I think doubles—I know. I know. This is something I learned in the daily course of my business here for the bureau and my conversations with carriers and inspecting their operations. I know that they avoid, in many instances, platforming by the use of doubles.

Q And wouldn't the same situation apply, aside from the five additional feet, for the use of 60-foot doubles, the elimination of cross-dock handling?

[112] A Certainly. The thing is, I've still got a $25,000, $30,000 a year man, counting benefits. A $30,000 a year man pulling the additional trailer.

Q But just addressing the point of cross-dock handling, that would apply with a 60-foot twin?

A Sure, they could avoid it.

* * * *

[113] CROSS-EXAMINATION

BY MR. LAMBERT:

* * * *

[115] Q To your knowledge, has Consolidated Freightways or Raymond Motor Transportation petitioned for lower rates as a result of the Supreme Court decision in that case?

A Have they petitioned us to lower the class weight level?

Q (Nodded.)

A No.

Q From the rate standpoint as opposed to a cost standpoint, what has been the economic impact upon Consolidated Freightways by lifting of the ban in Wisconsin?

A Well, to the extent it has lessened their expenses, it is reflected in the updates we have, which we utilize in the total rate structure, which [116] we maintain throughout the Middle West and between central states and Middle West and between central states and Southwest, Middle West, Southwest. So it has an effect. How marked, I can't say.

Q And in that effect reflected in the rates?

A Certainly. If the increase is less, the outcome of the rate is less; therefore, it has been.

* * * *

[134] RECROSS-EXAMINATION

BY MR. PAFF:

Q Mr. Happer, have you made any calculation with regard to what effect a return on shareholder equity might be with regard to—prior to this time?

A For the year 1977 for the total of 111 carriers—

Q I mean just on the impact on C. F. shareholders prior to today?

A No. Heavens, no.

* * * *

JURAT

* * * *

DEPOSITION OF GOV. ROBERT D. RAY

Filed June 6, 1979

[Caption Omitted in Printing]

* * * *

[20] Q The purpose of the message is to explain your position in vetoing the bill, is that correct?

A Yes. I think I could merely say, "I hereby disapprove of the bill because I don't like it," or I can give extended reasons. I think I have broad and wide latitude. But that is the reason for the message is to allow people to know what my reasoning was for not approving the bill.

Q You have indicated earlier that the only time you have vetoed any legislation in connection with twin trailers would have been approximately 1974 and called your attention to the fact that you did issue a veto message on the 2nd of March, 1974, which was submitted to the Honorable Andrew Varley, Speaker of the House.

I am now going to ask you a series of questions about that veto message, and I am going to tender you a document which will be an exhibit in the proceeding at the trial beginning next week, and it can be identified as Plaintiff's Pre-Trial Exhibit 34, and in particular, directing your attention to Appendix M, pages 9 through 13. Do you have a copy?

MR. BITTNER: He has it in front of him.

[21] Q In preparation for this deposition today, Governor have you had or taken the opportunity to review that veto message?

A Briefly. I gave it a cursory examination this morning.

Q It is not my purpose to have you at a disadvantage, and to the extent that I ask you specific questions about any particular position of that message, you may take the time you feel is necessary to reacquaint yourself with the language.

In issuing a message such as this, is it your intention to list all of the reasons that you would have or all of the pertinent reasons that you would have for vetoing a particular piece of legislation?

A It isn't necessary, and I frankly do not recall if we had additional reasons. Sometimes we don't try to throw in every little factor. However, we try to put basically the reasons for a veto in the message, and I think that is what we did here.

Q There may be some other reasons, but they would not be substantial or of such importance that you thought they ought to be explained to the houses of the Legislature?

A I think that is a fair statement. At least, we did not rely on them as the reason.

[22] Q I am looking at the third and fourth paragraphs of the veto message and where there is language which would indicate that the proposed legislation "would benefit only a few Iowa-based companies while providing a great advantage for out-of-state trucking firms and competitors of our Iowa citizens.

Would you characterize that as one of the principal, if not the principal reason for vetoing the bill?

A Well, that has to be explained, and I think it is somewhat explained in the rest of the statement here. When we talk about the expense of our Iowa citizens, we talk about the cost of maintaining the highways, particularly in this case I-80, which would be borne solely by the citizens of the state and not by the use of federal funds as is true when we construct an interstate highway, which is on a 90-10 basis.

Granted, there are fees, but there are tremendous costs. The safety factor was a consideration which applies when you overcrowd a highway, and that affects the the public, the citizens of this state. And so, that statement, that paragraph, I think is true and is accurate and we relied on that, but it takes into consideration [23] safety, convenience, and comfort of the people of this state.

Q At the time that the message was prepared in 1974, did you perceive that operation of sixty-five-foot twin trailers in Iowa would be a benefit to people outside the State of Iowa or greater benefit to people outside the State of Iowa than those inside the State of Iowa?

A It would benefit those who would be benefited regardless of where they operated, where their base of operation might be located. But, if you add up numbers, most certainly the out-of-state benefits would be much greater than would the benefits for the people within the state.

Q What out-of-state benefits would you be referring to?

A Well, what I am saying is that if there is some benefit for any firm to have sixty-five-foot double-bottom trucks instead of a maximum of sixty, that benefit would inure whether the firm were located in Iowa or somewhere else. It was my feeling at that time that miles travelled in our state would be greater in total numbers of those firms outside of the State of Iowa.

Q So that I can understand better, when you are [24] talking about benefit to firms outside the State of Iowa, are you restricting that, to trucking firms located either in the state or outside the state?

A Well, it would be trucking firms or those from ownership by companies that were not common carriers.

Q Your response is limited to those who would be involved in transportation whether they are a for-hire transportation operating twin trailers or a company that has its own transportation fleet; that when you were talking about firms that would benefit, those are the firms to which you make reference?

A Yes.

Q You are not directing your concern to the shippers or receivers of goods that would move on sixty-five-foot twin trailers, is that correct?

A Well, I am not limiting it so that it would not apply thereto, because I presume, for instance, if a company is located in Pennsylvania, there will be some benefit derived thereto as well as just to the truckers or just the people that operate the trucking firm.

Q Well, insofar as the paragraph to which we make [25] reference, the fourth paragraph on the first page of the veto message, if the Iowa-based companies you are referring to, Iowa-based trucking companies while providing a great advantage to out-of-state trucking firms— I am trying to get my understanding and interpretation of your language. Is that a fair understanding?

A Well, I think basically that is what I am talking about. I am trying to explain that it wouldn't benefit just the trucking companies. It would benefit anyone that used that size truck, whether it be a trucking firm or a company, manufacturing company. But to answer your question, yes.

Q It was your perception at the time this message was issued that the predominate use of sixty-five-foot twin trailers in the State of Iowa if authorized, if that legislation had been approved, would be in connection with shipments moving through the State of Iowa as opposed to shipments either originating at or destined to a point in the State of Iowa?

A It's my understanding that the bill would apply for all, and that we would then have a considerable amount of additional travel by large trucks and that that would create additional problems with [26] the maintenance of highways and congestion, and there was the safety factor.

Q All right. Now, you would perceive, then, that an authorization of sixty-five-foot twin trailers would have increased the number of vehicles operating in the State of Iowa?

A Right.

Q On what did you base that conclusion? I mean, where were the vehicles previous to this, or are we talking about new traffic? Do you understand the nature of my question?

A Yes. Based on what was written and said by the secretary for the truckers association, we concluded that there would be a considerable number of trucks coming across our state that today were travelling across other states, and that additional traffic, we felt, would be considerable and mostly on I-80, which was a highway already deteriorating and already congested, based upon what we were hearing from different people, including truckers.

Q I want to pursue this so I make sure my understanding is correct. There would not be an increase, a sudden increase in the traffic moving across the nation as a result of the approval of the sixty-five-foot twin trailer, but rather you perceived [27] that there would be rerouting of the national transportation system through Iowa as opposed to going through other states?

MR. PAFF: I will object to that "rerouting of the national transportation system" as being a poor form of the question. I do not think there is any evidence in this case than twin trailers form a national transportation system. We object to the form of that particular question.

Q So that we move ahead, Governor, did you understand that I was talking merely about the movement of commerce insofar as motor vehicles are concerned, not necessarily that there was a national transportation policy or anything of the sort? I am just talking about the movement of goods by motor vehicle and that—

A My understanding of your question is that some of the traffic now going across Missouri would then come across Iowa if we allowed sixty-five-foot double-bottom trucks.

Q Okay. So in talking about the additional trucks to Iowa, you acknowledge that those trucks are now moving and transporting goods to and from points not located in the State of Iowa and are using routes other than I-80 or the routes in Iowa?

[28] A Yes.

* * * *

[30] Q I am not sure I artfully stated that, and perhaps I should try again.

In connection with the carriers who you understood would be utilizing Interstate 80 in connection with sixty-five-foot twin trailers, did you recognize that the traffic handled by those carriers would consist primarily of interstate shipments moving either from a point east of Iowa to a point west of Iowa, or from a point west of Iowa destined to a point east of Iowa?

A That was my understanding.

* * * *

[35] Q In connection with the safety considerations which you have referred to earlier in your veto message, you indicated overcrowding of highways. If I may direct you attention to the second full paragraph on page 3 of your veto message, you indicate "This highway has been described as one which is already overcrowed, congested and breaking up because of wear and tear." Would you indicate what is the source of that conclusion or who was the source of that statement?

A Well, I think that comes from a number of sources, of peole that we would check with, including those in the Highway Commission at that time. We heard from a number of truckers. When I say "a number," I am talking about maybe half a dozen, eight, I do not know how many, but truckers that would call and tell us this. We heard from independent truckers that would say that this is not in their [36] best interest—the bill that I vetoed—and they would talk in these terms and particularly in the western part of the state. The feeling was that the highway was hard to maintain.

Q Who in the Highway Commission did you consult?

A Joe Coupal was the director at the time. Most of this was done by staff and checking with staff members. I can't tell you specifically now names of people.

Q If you would, then, direct your attention to the next paragraph where you indicate that fees paid by trucks provides some cost, "but the Highway Commission advises that each truck does not pay its share of cost of maintaining the highways compared to passenger vehicles."

Do you recall who in the Highway Commission gave you that information?

A No. We might be able to find that by going through our files.

Q Was it your understanding at that time that the Highway Commission took the position that trucks paid less of a share of the highways as compared with passenger vehicles?

A In accordance with the damage done by the vehicles, yes.

[37] Q In the last paragraph on the veto message, you talk about no reference to additional fees. Was it your understanding at the time you issued the message that the use of the highways by sixty-five-foot twin trailers would not result in increased income to the state through usage fees or registration fees?

A No, it was my understanding there was no provision for any extra damage that might be done, and there were arguments about how much extra damage there might be. I was somewhat familiar with the argument that by spreading out the load, there would be less damage per truck and the argument by others that when you have twin trailers with simple axles, you have more or less like the woman's heel, which sounds trite.—I am sure you have heard many times—and there is more damage. In any event, I think the feeling was at that time that there would be more weight regardless of distribution because the purpose was to fill the containers, the trailers, and there will be no provision for any extra fees for any additional weight that might be included and more damage done as a result.

Q When you said at that time the message was issued that was your feeling—if I could try to bring [38] that into your present perspective. Are you aware of the fact that in connection with this litigation, the Plaintiff and the Defendants have filed factual statements and responses that deal with the issues involved in this case?

A I am not familiar with that.

Q I do not want to have you at a disadvantage in making reference to the statements and admissions on pages 52 and 53, numbers 187 and 190, indicating that on rigid pavement types a twin trailer weighing a maximum of 73,280 pounds has less 18 Kip EAL's than a semitrailer similarly loaded.

MR. PAFF: That is not a proper statement on what 190 says. Is that what you are referring to?

MR. GOETTSCH: I was referring to 187. Perhaps I ought to—

MR. GOODWIN: Cecil, maybe just to move this along, our office has had only one copy which we loaned to the intervenors last night, and I can guarantee the governor has not read it, because I have not, either.

MR. GOETTSCH: Okay. Let's strike the question and I will start over.

Q You indicated that at the time the veto message was issued you were aware of arguments that sixty-[39] five-foot twin trailers may cause less damage to highways than semitrailers with similar loads, and you are also aware of arguments on the other side. Are you now aware that insofar as this litigation is concerned, the defendants have admitted that on rigid pavement types, a twin trailer weighing 73,280 pounds and with a load distributed proportionately as to Consolidated

Freightways recommended loading practice will have fewer 18 Kip EAL's than a semitrailer weighing a similar weight, or 73,280 pounds with a load distribution proportionately as C.F. recommended loading practices; that the defendants have admitted the accuracy of that statement. Are you aware of that through the course of this litigation?

A I am not aware of that. I presume you are talking about both of them being loaded to capacity.

Q Yes.

A It is my understanding that one of the big arguments for sixty-five-foot double-bottom trucks is that presently the semitrailers are not loaded to capacity, where they could be if you had sixty-five-foot double-bottoms, and that is part of what I was referring to a moment ago when I said that there would be, we felt, additional weight [40] because of loading it to capacity if they had additional length.

Q All right. Again, I have you at a disadvantage since you have not looked at this, but I want you to be aware that just that consideration has also been presented in this litigation.

MR. PAFF: I will object to that gratuitous comment with regards to what that concern is expressing. If you are referring to 190, I think that is a total mischaracterization of that previous answer.

Q Okay, then I will withdraw my previous gratuitous comment and ask you if you are aware that in Item 190, the defense has admitted the accuracy of the following statement: On rigid pavement types, at 65,000 pounds, a twin trailer with even load distribution has 7 percent fewer 18 Kip EAL's than does a semitrailer weighing 63,000 pounds with an even load distribution.

Were you aware that that admission had occurred?

A No.

Q Now, directing your attention to the first paragraph on page 4, as I understood—

A Just a moment. Let me find that. Okay.

Q Having reviewed the first five paragraphs on page 4, [41] I have the impression that it was your position there was some ambiguity in the legislation presented to you as to where twin trailers could be operated?

A Yes.

Q Do I understand the second paragraph to mean that if sixty-five-foot twin trailers would be operated only on four-lane highways and not on all highways, that this would be a disadvantage to some Iowa industries?

A Yes.

Q If that was the concern?

A Yes.

Q Upon what information did you base those concerns?

A That if sixty-five-foot double-bottom trucks were advantageous to a special interest and would hold true, I think, that if those trucks were allowed only on interstate highways within a five-mile limit that industry would locate along the interstate highway. Interstate highways do not go through most of our small towns in this state. Most of our small towns need industrial development, and I concluded that if that were true, then it would put some of our small communities at a distinct disadvantage.

[42] Q Would it be equally true that the absence of sixty-five-foot twin trailers in Iowa places Iowa industry at a competitive disadvantage with industry located in Illinois or Nebraska, Missouri or Minnesota?

A As I pointed out in the message, our growth has been steady and has been greater than surrounding plains states and better than the national average, so we do not feel that that was a great sacrifice that our state would be making.

Q The absence of sixty-five-foot twin trailers would not detrimentally affect Iowa? Is that your—

A That was my conclusion that when you weigh the advantages versus the disadvantages, I felt the disadvantages were much greater.

* * * *

[45] Q So on the particular issue, and if you could confine your response to that question, sixty-five-foot twin trailers operating across Interstate 80 through [46] Iowa, it is your opinion it would mean less miles of travel, and assuming constant speed over either route, less fuel consumption?

A They should, yes.

Q Now, you indicated a concern about fuel availability. Do you mean by that that interstate carriers transporting interstate goods using Interstate 80 through Iowa would purchase or otherwise acquire fuel in Iowa for use in those operations that they are now acquiring at some other state? Is that what your concern is?

A Yes.

Q You recognize, again, we are talking about vehicles. If we can bring that to the present perspective, Governor, we are talking about vehicles that are now being operated in states other than Iowa that if could be operated in Iowa would be using Iowa fuel. Were you limiting your comments to the 1974 perspective?

A I guess I was trying to respond to both. At that time while somebody in Washington said truckers would have 100 percent of need, no one told us then how they would get that, and we are seeing it now in the energy crunch. Someone can say, "We'll take care of the farmers," but it was Iowans [47] that took care of the farmers with a set aside program that already existed, not somebody outside that was helpful to us. And with an allocation system today and with the amount of fuel that we have had in this state, I do not know where extra fuel would come from that we would have to supply if we had additional traffic.

Q Based on your understanding of the present operations of sixty-five-foot twin trailers in a circuitous route through Missouri as opposed to I-80 through Iowa, is it your present perception that there are more gallons being consumed by those operations, assuming the same speed limit, than would be consumed if the operations were across Interstate 80 in Iowa?

A I am assuming this: You represent the people. You know better than I if that is what they're doing is travelling extra miles to take advantage of the extra five feet. They can come through our state with sixty-foot limits like anyone else, but if they are going out of their way, going around our state so they can take advantage of bigger trucks than we allow, I have to presume if they could cut miles off, they would burn less fuel.

Q Directing your attention to the second to the last [48] full paragraph on page 4 of your veto message, you indicate it is unfortunate that Iowa did not have a department of transportation which could have been helpful in ascertaining the desirability of any change in size of truck. Subsequent to the issuance of this veto message, your efforts in connection with legislative proposals were successful in the creation of an Iowa Department of Transportation, isn't that correct?

A We did get the Department of Transportation.

Q And wasn't the Department of Transportation one of your legislative proposals?

A Yes.

Q The purpose of the Iowa Department of Transportation is to coordinate the considerations of all transportation activities, is that right?

A Yes.

Q Subsequent, then, to the creation of the Department of Transportation, were many of the people with whom you had previously contacted and relied upon for information with the Iowa Highway Commission, did those people become staff members of the Department of Transportation?

A Yes.

Q And are those people the people upon whom you rely [49] as your principal sources of information concerning transportation in the State of Iowa?

A Presently?

Q Yes.

A The people that were transferred and the—

Q No, I am sorry. The staff people with the Iowa Department of Transportation.

A Bascially, yes.

Q Now—

A And the Commission members.

Q If you would refer in the document which is before you now, Plaintiff's Pre-Trial Exhibit 34, Appendix M, and turn to pages 14 through 21. This is a document which was taken from the files of the Department of Transportation. Referring, if you would, to that, you will recognize that pages 14 through 18 are merely a restatement of your veto message and with certain sections underlined and reference notes. Have you seen this document before?

A I saw it a long time ago. I have not seen it recently.

Q You are aware that it is staff comments concerning agreement or disagreement with conclusions reached in your veto message, is that correct?

[50] A Yes.

Q Directing your attention to Item 6, and this would appear on page M-19, the veto message indicated that additional truck traffic in Iowa without the extra-sized trucks has continued to increase during each of the last five years at 11 to 13 percent. The staff comments indicate that the study of increased truck traffic was substantially less than that, or 5.9 percent.

Do you have any reason or independent knowledge through which you would disagree with the staff conclusion?

A We might see if we can find our source of information. I do not know that Robert Studer is any more astute than wherever the information came from that we used, and I do not know that we went back the same number of years. But it is nice that you called that to my attention, because I will check and find out just where our information came from.

Q On the next page, Item 7, the reference is made to—

A Incidentally, if I may comment, 5.9 percent isn't bad.

MR. GOETTSCH: I guess the question was "may you comment," and for my purpose, the answer is [51] "no." I move to strike the comment.

Q Directing your attention to the next page, Item 7, the indication is in your veto message: "We believe some of the best available data come from the National Safety Council which indicate that twin trailers have fewer accidents than passenger cars comparing the same number of miles driven. But, they have a much higher fatality rate among the accidents that do occur." Then you go on to say that "The 1973 accident facts of the National Safety Council show that these trucks have 2.3 percent of our accidents but account for 6.6 percent of our fatalities."

When I originally read the veto message, I thought that the reference "these trucks" referred to twin trailers. At the time that the veto message was drafted, was it your understanding that the statistics indicating 2.3 percen of the accidents accounting for 6.6 percent of the fatalities was relating to twin trailers, or to trucks in general?

A My memory serves me well. We were talking about large trucks, and the point was if you have many more trucks, you are inclined to have more accidents, and when you have an accident with a large truck, the trucker wins.

[52] Q Now, if I may pursue that, under the present situation with the prohibition against sixty-five-foot twin trailers in Iowa, is it your understanding that we have in

Iowa a lesser number of vehicles operating across Interstate 80 because of that limitation?

A It is my understanding we will have many more that could cut some mileage from their trip if they came across Iowa. We would have many more trucks.

* * * *

Q Now, Item 9 makes reference to the fees paid by truckers, and the reference in your veto message to the statement: "True, fees each truck pays provide some of that cost, but the Highway Commission advises that each truck does not pay its share of cost of maintaining the highways compared to passenger vehicles."

Directing your attention to the [Iowa DOT] staff response which says: "The new cost allocation shows that trucks and cars are now nearly equally deficient in covering their responsibility. Automobiles cover 86.7 percent of responsibility, trucks an 86.8 percent of responsibility." Are you familiar with that new cost allocation study by the DOT to which reference is made in that comment?

A The new ones they are talking about here?

Q Yes.

[60] A No. I know the chairman of the Highway Commission and now chairman of the Department of Transportation certainly disagreed with this, and this was not what we had been advised at the time of our veto message.

Q When you say the chairman of the Highway Commission and now the chairman of DOT, you are referring to whom?

A Bob Rigler.

* * * *

Q The conclusion of your veto message in 1974 was basically that sixty-five foot twin trailers were a greater advantage to interests outside the State of Iowa and would not have much benefit to the [76] interests inside the State of Iowa. Is that a correct statement of that position?

A I view my job as one to protect the best interest of the people of my state, and in doing so, I have to take into consideration, I think, the safety, the well-being, and the convenience of the people that live here. And I view the constitution as giving states sovereign rights, and the judgment comes from those who are elected to exercise it, and that means that there is a legislative process to be followed. Part of that legislative process is the role that the governor has on either approving or disapproving legislation. I presently have no piece of legislation before me upon which to act.

Q During your tenure as governor of the State of Iowa, you have had an opportunity to approve or disapprove a number of pieces of legislation which impact upon the legal weight, length, and width of vehicles than can operate on the highways of the State of Iowa. In conjunction with your comment, I would like to ask you some questions in that regard.

On May 29, 1974, you approved legislation in Senate File 1141, which included in Chapter 29 of that act—I am handing you a copy of that document—increase to allow the length of a [77] livestock trailer to have an overall length of sixty feet. The effect of that legislation was to increase the length of vehicles from fifty-five feet for a semitrailer to sixty feet. Do you recall your approval of that legislation?

A Yes.

Q Did you, before signing that legislation, cause a study to be made as to the safety impact or the impact of increased number of vehicles as a result of that approval?

A My recollection is that we looked to see if we would add additional traffic that would be very significant, and the feeling was that that would not increase significantly the amount of traffic.

Q With whom did you consult either in your office or with the DOT?

A If you go down all pieces of legislation and ask whom I consulted with, I will have some problems. Most of this work was done by staff, and in each case I would think we discussed the different ramifications and whether this was consistent with what other action we had taken in other cases, such as House File 671. I cannot tell you with whom we discussed this, because I do not have the recollection of individuals.

[78] Q On the issue of the approval of an exemption authorizing sixty-foot semitrailers for the transportation of livestock, are you aware of the fact that sixty-foot semis exceed the geometric and pavement design criteria for many of Iowa's older highways?

A That would not surprise me. Again, I do not think that this change increased the traffic that we already had, and in numbers, it was my opinion that that was far fewer than what we were talking about in sixty-five-foot double-bottom trucks.

Q Do you understand that the sixty-five-foot trailer for livestock authorized by that legislation could be operated on any of the highways in Iowa?

MR. PAFF: I object to that. You said "sixty-five foot."

MR. GOETTSCH: I am sorry. I am glad you objected. I will restate the question entirely.

Q Are you aware that the legislation which you approved authorizing sixty-foot semitrailers for the transportation of livestock could be operated on any highway of the State of Iowa?

A I think that is true.

Q Are you aware of the fact that a sixty-foot semitrailer exceeds the AASHTO, which is the [79] American Association of State Highway and Transportation Officials, recommended vehicle length standards?

A I was familiar with that, or at least aware of it.

Q In the face of the facts that the sixty-foot configurations would exceed the geometric and pavement design criteria for Iowa's older highways and would exceed the recommendations of the American Association of State Highway and Transportation Officials, what benefit to Iowa did you foresee which would offset those differences?

A My recollection is that we would not have additional numbers of trucks to any great extent and that there was an argument of safety that on a state road, a tractor of this type was basically safe.

MR. BITTNER: I do not believe the governor is aware, because he certainly has not had this before him, but for the benefit of the record, we have admitted that the exemption does benefit livestock carriers, stockyards, and processors, which are economic interests of importance to Iowa.

A There isn't any question about that.

Q Would that have been an important consideration in your approval of this legislation?

[80] A Well, that is a basic consideration in every bill that comes to me. If I sign a bill, I believe that it basically has value to the people of the State of Iowa.

Q In connection with—

A And incidentally, If I may interrupt you, I pointed that out in my veto message of the sixty-five-foot double-bottom bill, also, that I saw some value, but I saw more disadvantage than advantage.

Q Disadvantage or advantage to whom?

A To the people of the State of Iowa.

Q That the sixty-five-foot twin trailers would be a disadvantage to the State of Iowa?

A On balance, yes.

Q And on balance, they would be advantageous to citizens of other states?

A Well, I presume that someone would have some advantage if there is an advantage in having sixty-five-foot double-bottom trucks.

Q Am I correct in my understanding that as to the sixty-foot livestock authorization, one of the principal considerations was that there would not be an overall increase in truck traffic?

A I said "substantial increase." Whether there would [81] be some increase, I don't know.

Q Could you quantify what you mean by "substantial" in terms of overall traffic patterns?

A It was my opinion that we have had this type of trailer carry livestock in our state, and the argument is made that the additional length here would reduce the number of trucks, the same argument that is made with sixty-five-foot double-bottoms and that we are not going to get an additional number that will be travelling across the state adding to the volume of traffic.

Q Then distinguishing the sixty-five-foot livestock semitrailer from the sixty-foot—pardon me sixty-five-foot twin trailer, the difference being that in your perception there would not be sixty-foot livestock trailers merely thereafter versus being through the State of Iowa as you perceive what happened with sixty-five-foot twin trailers?

MR. PAFF: I will object to that question as being argumentative.

MR. BITTNER: You are having trouble with the sixty, sixty-five. You did that wrong.

Q Let me—

A I think I understand what the question is. We did [82] not perceive that we would have a substantial additional number of vehicles which would add to congestion and add to the safety of our state.

Q Now, I am trying to frame a distinction between sixty-five-foot twin trailers, which you perceive would cause additional vehicles, and sixty-foot semitrailers for livestock, because in each instance they are talking about a five-foot increase in overall length. Am I correct that you are basing your difference on the fact that there was not prior to the approval of the sixty-foot semitrailers for livestock a situation where motor vehicles of that length were using highways in states other than Iowa in the transportation of interstate shipments that would be diverted through Iowa with approval of that legislation?

MR. BITTNER: I will object to the form of the question. I do not understand it.

A I would appreciate it if you could rephrase it or repeat it, at least.

Q Well, I am trying to get the distinction between sixty-five-foot twin trailers and sixty-foot livestock trailers, and particularly because your response indicated that both of them, the sixty-five-foot twin trailers and the sixty-foot semi- [82] trailers for livestock, involved a five-foot increase, that for semitrailers that would increase their productivity and so you did not perceive an increase in the total number of trucks on the Iowa highways by approving that legislation, but you would with sixty-five-foot twin trailers. Could you make that distinction?

A I have trouble joining the two because you add five feet to another kind of truck. Your argument apparently is that you should be able to add five feet to another kind of truck. This is the kind of truck where by adding the additional five feet, we were providing some benefit, economic benefit, to the people of this state. We were not saying we would do this only for trucks that were based in Iowa, nor were we saying we would allow this only for trucks that came into our state and do not come out of our state. We were saying this is uniform for all trucks, all livestock trailers that are sixty foot, and we do not believe we got additional numbers to any extent, any great extent of traffic, and we did not add to the congestion or to the safety problem.

Q Insofar as sixty-five-foot twin trailers are concerned, though, that authorization on Iowa [84] highways would increase the number of sixty-five-foot twin trailers operating in Iowa because in your opinion, they are not operating in other states?

A Yes.

MR. GOODWIN: Wait a minute. Increase the operation of sixty-five's in Iowa? None of them are legal to operate now.

MR. LEDERER: Increase from zero.

MR. GOETTSCH: With that understanding, increase from zero.

Q Section 30 of the legislation that was signed involves the legalization for purposes of operation of vehicles in the border cities of Iowa if those vehicles conformed with the legal length and weight limitations of the state on which those cities bordered as of July 1, 1974. Are you familiar with that particular legislative provision?

A The border city exemption, yes.

Q And you supported that exmeption?

A Yes.

Q And worked with the Department of Transportation in trying to devise a means by which these larger vehicles could be allowed to enter our state at the border cities, is that correct?

[85] A Yes. I am really not anti-truck at all.

Q The purpose of that exemption was to allow industries, businesses, manufacturing concerns in Iowa's border cities to have access to that equipment that would be available in the immediately adjoining states, is that correct?

A Yes.

Q Did you make any studies or request any data concerning the safety of the operation of these vehicles in the border cities?

A We did some research at the time to try to determine numbers, although numbers were not particularly important to us. In this instance, the feeling was that it was not practical or realistic when delivery was to be made just on this side of the river to require the breaking down of that truck and we did not have the problems we had with a longer double-bottom truck. We were not going to attract more vehicular miles, more congestion. In fact, less by allowing that vehicle to continue a couple of miles through a city to a packing plant.

We thought that we could leave that to the best judgment of the city council to make sure that these vehicles could travel on designated [86] routes, if that be the desire of the local public officials. We did not have speed to contend with. We did not have more trucks to contend with. We had an economic base that could be benefited from this, and so we felt that there were distinct advantages that far outweighed any disadvantage in this particular case.

Q The disadvantages or advantages to whom, the citizens of Iowa?

A The citizens of Iowa.

Q Also during your tenure you have approved and signed House File 189 during the 65th General Assembly, making reference to a pending sale, Exhibit PPX-34, which you have before you, Governor Ray. You will see that that particular act extended the width [length] limitation on truck trailers manufactured in Iowa. Do you recall that particular legislation, or do you have any present recollection of that legislation?

A I recall that.

Q Do you recall any specific studies, safety concerns, or requests for documentation that you asked to be provided to you before you signed that legislation?

A If you are going down the list of them, may I just [87] say that there was some research done on each bill, and I would be happy to tell you what my recollection is relative to what we found. I cannot tell you in any one of these cases who the person was that was contacted or who the person was that did the contacting.

My liaison that works in this area is Dutch Vermeer. Dennis Nagel is my legislative liaison. If you need to know specific individuals, I could contact either one of them and get you additional information.

Q Do you have any present recollection as to whether approval of that amendment would increase or decrease the amount of vehicular movement on Iowa's highways?

A I don't recall a great deal of information that we received relative to this. I think in signing it, I believe that again there would be some economic benefit to the State of Iowa by allowing this. I think we allowed it for, again, all people regardless whether they were residents or nonresidents, but it was a way in which we could move a product that was manufactured here. We allow additional size, overweight, and so forth on emergency basis or on a single trip basis, and I [88] think this fit in that category.

Q But you will agree with me that it benefits Iowa industry because it is limited to truck trailers manufactured in Iowa as opposed to truck trailers manufactured in some other state and moved into the State of Iowa?

A I would want to look at that particular piece of legislation. You probably have researched it. I guess my memory doesn't serve me well whether it is limited only to those that are manufactured here and does not include those manufactured outside of Iowa coming into Iowa. I don't remember that to be the case, but perhaps it is.

Q I have before me a certified copy of that act, and it would indicate that the issuance of annual trip permit is for the movement of truck trailers manufactured or assembled in the state that exceed the length specifications.

MR. GOETTSCH: As a statement of counsel, it is my understanding that that is the import of that exemption.

A That would appear to be to be correct.

Q Directing your attention to Item 4 under Appendix L, legislation in the 66th General Assembly which would allow the issuance of single trip permits [89] for mobile homes and factory-built structures with width between twelve feet five inches and fourteen feet five inches overall length and where the overall length of units and the factory-built structure does not exceed eighty-five feet. Do you have any recollection of that particular legislation?

A I recall vetoing one bill relative to this subject, and the following year, I believe, was the year when a bill was presented to me that I thought was acceptable.

Q When the bill was vetoed, what were the provisions that you found objectionable?

A As I recall, that bill would allow these homes to be moved any place at any time on any highway, regardless of the benefit or regardless of the width of the road. It allowed just about anything and everything. I think the second bill had some restrictions and was not for mere travelling with wide homes but was for the purpose of moving one into or out of the State of Iowa.

Q Then the previous provision which you found objectionable would have allowed the movement of oversized mobile homes through the State of Iowa which would not necessarily have an origin or [90] destination in Iowa, is that correct?

A It, too, would have increased, we felt at that time, the amount of this kind of traffic which we did not believe could really accommodate.

Q So that I can understand with specificity, the increase in the amount of traffic would be because it was not limited to movement either originating at or destined to a point in Iowa but would have also included traffic moving to Iowa, is that correct?

A It would have included that, yes.

Q That was the amount of the increase that you found objectionable?

A That was one aspect of the bill that I found objectionable.

Q Okay. You indicate that the previous bill would have resulted in more traffic, and I thought it was only on movements that merely traversed the State of Iowa. Was there another reason why the objectionable bill would have created more traffic?

A I think that is basically when you talk about traffic where the traffic would come from.

Q Item 5 on Appendix L, special permit for divisible loads issued for special emergency situations. Do [91] you recall that particular legislation?

A I recall it. I can't tell you all of the details of that measure.

Q You have from time to time in your position as governor of the state issued special proclamations acknowledging emergency situations for the movement of oversized loads, is that correct?

A Yes.

Q Governor Ray, directing your attention to page G-3 in Exhibit PPX-34 which you have before you, that document will be an exhibit at the trial and indicates the emergency proclamation either issued by your office or by the Department of Transportation pursuant to the legislation which you signed.

Reviewing that, do you recall or do you have knowledge of the emergency proclamation which you issued for the transportation of hay and fuel as well as those for grain which were issued by the Department of Transportation?

A Yes, I have recollection of issuing emergency proclamations. I am taking your word for it that these are the ones. Without seeing it, of course, I cannot recall dates and times.

Q I understand that. Those particular proclamations [92] are a part of the exhibit you have before you as the subsequent pages. If I can just ask some general questions about your issuance of proclamations, is it generally correct that they are issued because you perceive a need for the citizens of Iowa for movement of hay or movement of fuel which can be accommodated most easily through increased vehicular size or increased loads?

A We have not felt that this is something that should be authorized on a continuous basis but when there is an amergency, and I think in each one of these cases, there was an emergency. We felt it was advisable and necessary to issue the proclamation and allow an exemption.

Q The beneficiaries of the exemption in each instance are the citizens of the State of Iowa, is that correct?

A Yes. That is the purpose of it. In some cases I see I guess it was more than just the citizens of Iowa. I think we moved some hay, if I recall correctly, up to Minnesota, and if we found a fuel emergency, that benefits not only Iowans but people in the surrounding areas. That is mainly when there is a shortage. You know, it has an indirect and direct effect on people elsewhere. [93] Like the price of beef. During a winter snow storm if we lose very many cattle because we cannot feed them, not only do the people of Iowa have an economic loss, but so do the people outside of Iowa.

Q Previous to issuing the emergency proclamations, did you make any studies to determine whether they would be increasing vehicular traffic as a result of these proclamations?

A I think in these cases there was actually less traffic as a result. We do call upon the Department of Transportation to do some spot checking and some research to determine the advisability of a proclamation.

Q You have indicated in your testimony that with the special proclamations on emergency situations and with the increase to sixty feet for tractor-trailer livestock vehicles, it was your perception that the increase in size would increase productivity and thereby reduce the total number of vehicles or not have a substantial impact on the total number of vehicles operated?

A That is true, except the bottom line was the need for it in extraordinary circumstances. The proclamations were issued on the basis that there [94] was an emergency and not that we were just wanting to get farmers or anyone else at that particular moment a special benefit.

Q Directing your attention to the sixth item on Appendix L, the second page, the seventh item. This also represents a bill which you signed which would authorize farmers to transport hay, straw, and stover on implements of husbandry if the load exceeds eight foot and not be subject to permit requirements.

My understanding of that legislation is that it would allow farmers simply to exceed the width limitation if they were utilizing their own equipment irrespective of an emergency. Do you have any recollection to the contrary?

A Yes. Again, I think that we took into consideration the uniqueness of Iowa as an agriculaural state and the belief that there was some wisdom in allowing this to occur which would not increase the traffic but would actually benefit our basic economy.

Q But the provision of the act would allow vehicles which exceeded eight feet in width to operate on highways. You are aware of that provision. Were there any considerations to the safety impact of [95] larger vehicles operating on the highways? Do you recall any?

A I do not think there was a feeling that that would offer a great change or a substantial change in what the traffic was presently and the traffic that would occur with these particular vehicles.

Q Now, the Item 8 shown on Appendix L, exemption for auto carriers up to an overall length with overhang of sixty-five foot. Are you familiar with that particular provision?

A I recall that bill.

Q Now, my understanding is that prior to that bill, auto carriers were allowed to operate in Iowa with an overal length of sixty feet, and your approval of this bill would allow them to load the carriers in such a manner that the vehicles could overhang both the front and the rear as long as it did not exceed an overall length of sixty-five foot. Is that your recollection of that legislation?

A Yes.

Q Can you recall any specific discussions of documentation that you refer to concerning the safety aspects of that particular legislation?

A Like I said, I am really not anti-truck. There [96] was some reason to believe that this would not increase truck traffic, would not really add much in the way of weight, but that the new cars had bumpers that were extending beyond what they had previously, and so to require those carriers to drop one or two cars—I do not remember how many; one, probably—because the bumpers extended a little beyond what they had previously allowed us to make a decision we felt that was fair and reasonable to keep the sixty-foot maximum, but if it extended over slightly to accommodate those bumpers would not be distressing to us.

Q You recognized that sixty-five foot overall length vehicles carrying cars can operate on all highways of the State of Iowa by virtue of this?

A I guess we have not had much fear that they would. That might be true. It might be true that they could operate on other highways and not limit it just to interstates. I think most of them would be on interstates.

Q Did you perceive this as an economic benefit to the car dealers and others in Iowa who would be receiving products in this manner?

A In this particular case, I think we considered it in general. Perhaps we ought to reconsider it now [97] since the cars are getting smaller. Maybe it would be wise to reduce that so the sixty-foot limit would be maximum. That is the explanation I gave a moment ago as the reason.

MR. GOETTSCH: May we go off the record for just a moment?

(An off-the-record discussion was held.)

* * * *

CROSS-EXAMINATION

BY MR. BITTNER:

Q We have just spent a great deal of time talking about the granting of exemptions and have reviewed them in detail and the special proclamations. By the granting of these exemptions, has political pressure been removed from the legislative process [101] as it relates to the legalization of sixty-five-foot double-bottom vehicles?

MR. GOETTSCH: I will object to that unless proper foundation is shown.

Q You may answer.

A My answer would be no. They still have prerogatives, as they should.

Q Isn't it a fact that sixty-five-foot double-bottom legislation has been introduced in nearly every session of the Legislature since 1974—

A I would—

Q —in one form or another?

A I would have to look. My opinion is that it has been introduced each time. It passed the one time. I vetoed it. The veto was not overridden, and I have not received another bill allowing the increase since that time.

MR. BITTNER: I have nothing further. Thank you, Governor.

* * * *

JURAT

* * * *

DEPOSITION OF MICHAEL D. FREITAS

Filed June 1, 1979

[Caption Omited In Printing]

* * * *

[7] EXAMINATION BY COUNSEL FOR DEFENDANT-INTERVENOR MOTOR CLUB OF IOWA:

BY MR. LAMBERT:

Q Mr. Freitas, will you state your full name, title and business address please?

A My full name is Michael Dennis Freitas. My job title is Highway Research Engineer. My business address is the Federal Highway Administration, 2100 Second Street, Southwest, Washington, D.C. 20590.

Q And what is your educational background, sir?

A I have a bachelor's degree in Civil Engineering and a full academic year of graduate training in transportation and traffic engineering.

* * * *

[8] Q I hand you what has been marked as Exhibit One, can you identify this document?

(Marked as Defendant-Intervenor Depo Exhibit No. 1—witness, Michael Freitas—Proof Draft

* * * *

[12] A This research analysis that is described in Exhibit One involves an analysis of existing accident data from the state of California and the development of vehicle mile and ton mile measures of exposure for single and double trailers, tractor—trailer combinations in an effort to determine whether there was a difference in the accident experience of the two vehicles in question. At least in the state of California.

* * * *

[13] A The statement at the bottom of the cover page states, "The opinions and conclusions expressed in this publication are those of the authors and not necessarily those of the Federal Highway Administration".

Q Thank you. If you know, approximately how much Federal money was expended in the preparation of Exhibit One?

A In the preparation of Exhibit One approximately fifty thousand dollars was expended. That was the cost of the modification that was written for the contract.

* * * *

[23] Q What is the title of the report?

A "Comparison of California Accident Rates for Single and Double Tractor-Trailer Combination Trucks".

Q And was Exhibit Four prepared pursuant to the same contract procedure as Exhibits One, Two and Three?

A Yes it was.

Q And how would you describe Exhibit Four in relation to Exhibits One, Two and Three?

A It is the Final Version of the same report that Exhibits One, Two and Three are. One, Two and Three were draft versions. This was the version that was accepted by the Federal Highway Administration as the Final Product of Task P of the same contract.

* * * *

[24] Q So then is it a correct assumption that the data was gathered in the same method for Exhibit Four as Exhibits One, Two and Three?

A Yes. It is the same data and it was collected in the same method.

* * * *

[31] Q Mr. Freitas, I hand you what has been designated as Exhibit Six and ask you if you can identify this document?

(Marked as Defendant-Intervenor Depo Exhibit No. Six—witness, Michael Freitas—"Assessment Summary" prepared by M. Freitas.)

[32] A Yes. It was an assessment that was made by myself I believe—yes. I couldn't recall whether I had any assistance in preparing this document, but I don't believe I did. I believe I prepared it by myself. It is an assessment of research reports or analyses that I was aware of that somehow involved a safety assessment of double tractor—trailer combinations.

Q Why was this particular assessment study prepared?

* * * *

[37] Q Can you tell us, if you know, approximately when Project 1-U is to be completed?

A The overall Project is scheduled for completion in approximately 1982 or 1983.

* * * *

[47] Q With regards to this ongoing study in 1-U, could you expand on your comments with regards to the direction that its taking? For example, are you further going to study accident statistics in connection with safety?

A The overall project, the Contract FH-11-8835, a major portion of that is to study accident statistics, accident statistics the cotractor has developed as part of this contract. Other than Contract FH-11-8835 the Federal Highway Administration has no intentions to include other accident research as part of the Project.

Q Okay. And what direction are you going with regards to pinning down the safety aspects?

A Within the Project?

[48] Q Yes, sir.

A Well, Contract FH-11-8835 will, as I said before, investigate an accident data base that was developed by us to look at many size and weight questions in terms of their accident experience. FH-11-8835 also consists of an evaluation of the effect of increased truck size and weight on traffic operations under some conditions where we believe there could be an effect because of increased size and weight. There are many other areas within the Project, some that are directly related to the size and weight question, some are not so directly related to increased size and weight. The ones that are directly focusing on determining the safety of increased truck size and weight involve several studies on the handling properties or the dynamics of trucks as their weight increases, as their size increases, that sort of thing. We are also looking at the behavior and the attitudes of other drivers in the vicinity of trucks that are visually larger than say a standard tractor-trailer combination to determine if in fact the visual presence of these larger trucks causes the drivers of other vehicles to behave in an unsafe manner. We also [49] looked at the aerodynamic properties of trucks, partly to determine whether, as a truck got larger, its aerodynamic—its adverse aerodynamic effects on other vehicles increased. In terms of the investigation of whether there are safety problems involved in these trucks of increased size and weight, I believe that is the basic area we are looking into. There are other areas that are only slightly related to size and weight, such as, downhill truck accidents caused by fading (failing) brakes on a steep downgrade and there are other of those kinds of instances that are only slightly related to the increased size and weight issue, but are part of my project. It is planned that if and when we find safety problems that we will conduct further research to look at possible ways of correcting those problems, whether they be highway related, driver related or vehicle related. The final effort in this project is a planned cost evaluation of any safety effects we should determine compared to the cost of countermeasures that we have found to be effective in reducing or totally mitigating the identified safety problems.

* * * *

[80] [Q] did you routinely submit these [81] reports to others for their evaluation?

A The draft reports or that were Exhibits One, Two and Three?

Q Yes.

A Yes.

Q Did you receive an evaluation from a Mr. Hedlund?

A Yes I did.

Q And what is his position?

A I can't give you an exact position. He works for the National Highway Traffic Safety Administration.

* * * *

[86] Q So since we are drawing our accidents ninety-eight percent from the rural areas, wouldn't that tend to bias the results to show vehicles in rural areas to have a higher accident rate?

* * * *

[87] [A] It could bias the results that way. It could introduce a bias.

* * * *

Q Do doubles have a higher proportion of the total single and double population in rural areas than in urban areas according to the study?

A According to this classification data that is [88] repeated in the study, yes.

Q So if that bias applies it would bias against the doubles or that is, that it would show the doubles with a higher accident statistic than would be the case if your exposure data were on the same roads?

* * * *

WITNESS: It could be biased against the doubles. If there is a bias because of this combination of factors it would tend to raise the accident rate of the double in the study.

MR. LEDERER: Why would you think that there would not be a bias?

MR. LAMBERT: Same objection.

WITNESS: I didn't say I didn't think there would be. My point was that I can't tell you factually that the doubles rate is too high. It is higher than reality and the singles rate is lower than reality. In the combination of data, the way it was done, that could have occurred. To make it clear. Not all of the accidents [89] are rural accidents and you can't assume, because ninety-eight percent of the roads are rural, that ninety-eight percent of the accidents are rural so, it is not clear what occurred because of this combination of different data bases.

BY MR. LEDERER:

Q Did Mr. Hedlund do the mathematical analysis that would correct for such a bias if it existed?

A He did an analysis that would eliminate that bias if it existed. Even if he was to eliminate all urban counts that doesn't mean his analysis is unbiased.

Q If you eliminate the urban stations and go only on the rural stations is there a significant difference between the number of fatalities per mile traveled doubles or semis?

* * * *

WITNESS: Mr. Hedlund's reanalysis indicated that the statistically significant difference in fatality rates per vehicle mile traveled is no longer statistically [90 significant, which means, that you can no longer statistically prove that there is a difference, not that that difference is significant—okay?

* * * *

[96] Q Does the Department of Transportation assume responsibility for the accuracy of the data in this report?

A No.

Q Mr. Freitas, are you, yourself, willing to state [97] that the Exhibit, to a reasonable professional certainty states the relevant statistical safety of sixty-five foot, five axle twin trailers in California compared to fifty-five foot, semi-trailers in California?

* * * *

WITNESS: * * * [m]y answer would be, no.

MR. LEDERER: Would you sponsor this Exhibit and offer it to the Court as a true picture of the safety of [98] sixty-five foot, twin trailers in California as compared to fifty-five foot semis

* * * *

WITNESS: My answer to that question would have to be, no.

* * * *

JURAT

* * * *

DEFENDANT-INTERVENOR'S EXHIBIT 4

Report No. FHWA-RD-78-94

COMPARISON OF CALIFORNIA ACCIDENT RATES FOR SINGLE AND DOUBLE TRACTOR-TRAILER COMBINATION TRUCKS

March 1978

Final Report

Document is available to the public through
the National Technical Information Service,
Springfield, Virginia 22161

Prepared for
DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
Washington, D.C. 20590

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. FHWA-RD-78-94	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle Comparison of California Accident Rates for Single and Double Tractor-Trailer Combination Trucks	5. Report Date March 1978 6. Performing Organization Code
7. Author(s) Chang S. Yoo, Martin L. Reiss, & Hugh W. McGee	8. Performing Organization Code
9. Performing Organization Name and Address BioTechnology, Inc. 3027 Rosemary Lane Falls Church, Virginia 22042	10. Work Unit No. 11. Contract or Grant No. DOT-FH-11-8835
12. Sponsoring Agency Name and Address Federal Highway Administration U.S. Department of Transportation Washington, D.C. 20590	13. Type of Report and Period Covered Final Report, Task P October 1976 to February 1978 14. Sponsoring Agency Code

15. Supplementary Notes

FHWA Contract Manager - Martha Schwendeman, HRS-41

16. Abstract

This report provides a comparison of the relative safety of two types of truck combination vehicles, singles and doubles. The single referred to in this report is a tractor unit attached to a semi-trailer, and the double analyzed consists of a tractor, semi-trailer, and full trailer, in that order.

1974 accident data for California, the State having the closest to a 50-50 split between the two truck classifications, was combined with estimates of truck exposure to arrive at accident and injury rates based on vehicle miles of travel. Also, estimates of average cargo weights were determined to evaluate the safety of the two vehicles on the basis of cargo ton-miles of travel.

The results of the analysis show that doubles resulted in more fatalities per million vehicle miles of travel, but that singles had higher accident rates on the basis of cargo ton-miles of travel.

17. Key Words Large Truck Safety Truck Accident Data Truck Exposure Data	18. Distribution Statement

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 70	22. Price

Form DOT F 1700.7 (8-69)

SUMMARY

This report is designed to provide a comparison of the relative safety of two types of truck combination vehicles, singles and doubles. The single referred to in this report is a tractor unit attached to a semi-trailer. The double analyzed consists of a tractor, semi-trailer, and full trailer, in that order.

A national count of vehicles identified California as the State having the closest to a 50-50 split between the two truck classifications. California was therefore selected as the location for calculation of the comparative accident rates of the two truck types. 1974 data represented the most recent year for which both detailed California accident and exposure data existed.

A number of very broad assumptions had to be made to adjust the Statewide truck exposure figures to the 97,318 miles (156,618 km) of roadway on which the truck accidents took place. (The California Highway Patrol, who provided the 1974 truck accident computer runs, patrolled 97,318 miles [156,618 km] of roadway out of the 169,616 miles [272,970 km] of California roads and streets in 1974.)

With this caveat in mind, it can then be reported that on California roadways in 1974:

- There was no significant difference between the number of doubles and singles accidents or the number of injuries per million vehicle miles (MVM) of travel.
- Doubles accidents resulted in a significantly higher number of people killed per MVM
- Based on the cargo hauled, singles had a significantly higher accident frequency and injury rate

> per million cargo ton-miles of travel. There was no difference in the number of fatalities, however.

Thus, assuming that the 1974 California results hold true for other locations and that the two types of trucks travel the same number of miles per year, the significant difference in safety is the higher number of fatalities involving doubles. On the other hand, if the two vehicle types haul the same fixed quantity of cargo the same distance, doubles would do so with significantly fewer accidents and injuries per cargo ton mile.

* * * *

DEFENDANT-INTERVENOR'S EXHIBIT 6

ASSESSMENT SUMMARY

Studies on the Safety of "Double Bottom" Operation

STATISTICAL ANALYSIS OF TRUCK ACCIDENT INVOLVEMENT, December 1971

Results: The accident rate of doubles was approximately half that of single tractor trailer units operating on the Indiana Turnpike. Analysis of the 1969 BMCS accident data showed no significant difference in the fatality rate (per accident) or doubles vs. singles. The injury rates of doubles were significantly higher than those for single combinations (on the order of 15 percent).

Limitations of Study: The sample is limited. Although the results were tested statistically, the Indiana data may not represent the national pitcure.

ACCIDENT EXPERIENCE OF DOUBLE BOTTOM TRUCKS IN CALIFORNIA, April 1973

Results: Accident rates and severity rates for tractor-semi-trailers and double bottom operating in California were approximately equal.

Limitations of Study: Accident data were analyzed only for half of 1972; vehicle miles of travel was estimated from vehicle registrations.

BMCS CARRIER SURVEY, March 1974

Results: There was no differences in the accident rates or severity of accidents for doubles vs. singles.

Limitations of Study: Data were collected by seven western carriers with a total accident experience of only

400-600 accidents per year. No statistical analysis was performed.

BMCS ACCIDENT ANALYSIS, July 1975

Results: Analysis of the 1973 BMCS accident data showed approximately equal numbers of fatalities and injuries per 100 accidents for trucks of 50-59 foot lengths (single combinations) and trucks of 60-75 foot lengths (double combinations).

Limitations of Study: No statistical analysis was performed. Fatality data may not have included occupants of autos.

NHTSA ANALYSIS OF BMCS DATA, March 1976

Results: Analysis of the 1973 and 1974 BMCS accident data showed the number of automobile occupants killed per car-truck accident was approximately 50 percent higher for doubles than for singles.

Limitations of Study: While the study does show that collisions of automobiles and double bottom trucks lead to more severe accidents, the lack of exposure data does not permit an analysis of the relative likelihood of such accidents.

BIOTECHNOLOGY, INC., ANALYSIS OF BMCS DATA, May 1976

Results: Analysis of 1974 BMCS accident data showed a fatality rate per accident for doubles that was approximately 35 percent higher than that for single combinations. Injury rates were approximately equal.

Limitations of Study: No statistical analysis was performed.

THE ECONOMICS OF THE MAXIMUM LIMITS OF MOTOR VEHICLE DIMENSIONS AND WEIGHTS, September 1968.

Results: One carrier reported that his double 40-foot trailers operated 43 million trailer miles with an accident frequency of 1,500,000 trailer miles per accident. This was compared to total "system" accident rate of 270,000 vehicle miles per accident.

Limitations of Study: 1,500,000 trailer miles is really 750,000 vehicle miles. Moreover the comparison appears to be between a trailer involvement rate and a system accident rate. Finally, the system accident rate appears to be 3 or 4 times too high for turnpikes or freeways. The operation of double 40's on eastern turnpikes is very restricted, making it difficult to judge their performance. Data from one carrier only further reduces the possibility of drawing any firm conclusions.

Prepared by M. Freitas
Offices of Research and Development
May 14, 1976

* * * *

PLAINTIFF'S EXHIBIT 2

Comments on the BioTech Truck Study [by Dr. Hedlund, NHTSA]

I agree with Parson's comments, and won't repeat them here. My additions to these comments follow.

The main problem with the study comes when it tries to match the exposure data taken from the counting stations with the accident data from the CHP. The exposure data is "explained" on pages IV-3 and following. IV-3, in particular, is a model of obfuscation. In a single paragraph, 5 different terms are used for the places where trucks travel: "State highways", "road", "highway", "California roadway", and "CHP" patrolled roads". Some of these terms appear to have precise definitions, and some do not. All of the calculations in this section apparently serve to cover up the main point: relative exposure of singles and doubles is assumed to be the same as the relative proportions of counts of these vehicles at the 15 counting stations of Appendix B. Thus, since singles represent 3.21% of the counts, and doubles 1.67,% both together will be 3.21 + 1.67 = 4.88%; the relative exposure of singles will be 3.21/4.88 = .658, and the relative exposure of doubles will be .342. This single assumption allows all of the relative exposure calculations to be carried out. The estimation of vehicles miles of travel is an afterthought, and doesn't affect any of the results.

* * * *

Fatalities: Expected number of singles is now 106.2 (instead of 110). "95% interval" is 94.0 to 118.4. Now the observed value of 96 falls nicely within the interval, and the observed value cannot be concluded to be significant at the 95% level. *The sole significant conclusion of the Table II-1* [the fatality comparison] *has just disappeared.* (The difference between the expected 106.2 and the observed 96 is 1.642 s—where s is the estimated standard deviation—so that this difference would be significant at the 90% level).

* * * *

DEPOSITION OF MARTIN L. REISS

Filed June 1, 1979

[Caption Omitted in Printing]

* * * *

[7] EXAMINATION BY COUNSEL FOR DEFENDANTS, RAYMOND KASSEL, ET AL.

BY MR. PAFF:

* * * *

Q Mr. Reiss, by whom are you employed?

A An organization called the Institute for Safety Analysis.

Q And what is the purpose of this organization?

A The purpose of this organization is to make studies for governmental agencies in the areas of safety studies. Safety research primarily.

* * * *

[9] Q Now could you briefly describe your educational background?

A I got an undergraduate degree in Industrial Engineering from New York University in 1957. I got a Masters of Business Administration from the University of Southern California in 1961 I believe it was. I have taken numbers of graduate courses and I have taught some safety courses as a guest lecturer.

* * * *

[12] Q Mr. Reiss, could you briefly describe your experience at BioTechnology in relation to what your duties were with them?

A Primarily the last few years or since 1975, my primary duty was to function as the principal investigator of a study that related to trucks and was looking at the various safety and traffic operations implications of potential increases in truck size and weight.

* * * *

[13] Q And what is it? [Exhibit 1]

A It's a draft version of a study I did on the comparison between 1974 accident rates of singles versus doubles in California.

* * * *

Q And could you briefly describe how this study came about that has been referred to in this particular document?

[14] A Yes. Somewhere in time during 1976 it began to dawn on some people in the Federal Highway Administration that the ultimate answers, dealing with truck safety coming out of the rather large study we were doing, would not be available for a number of years and they decided that it might be interesting to make an attempt to see if something, which everybody labeled as a "quick and dirty" effort in this area, might not be worthwhile to see if some indications of the relative safety of a tractor pulling one trailer versus a tractor pulling two trailers might be worthwhile and the Federal Government asked us if we might be amenable to doing this rather short term study and as a contractor we indicated that if there was some data we would certainly be willing to analyze it. We checked around rather briefly and found that of the various states running these two types of trucks California had a distribution of those vehicles closest to fifty-fifty. A fifty percent distribution of each. It wasn't in a number, but it was close to that per each and we contacted the people on the California Highway Patrol and asked them if they would be willing to provide us with a printout of the number of accidents that happened to these two types of vehicles in [15] California. They indicated that they would. And then we went back to the Federal Government and said, yes,

we could do that and sent them a proposal to do that and they funded us to go ahead with that and I believe it was something like in October of 1976, I think it was October, that they said to go ahead and we want the whole thing written up by December of 1976 and at which time we did make that analysis using existing data from the State of California primarily.

Q So you were engaged in a larger study trying to address this issue and this "quick and dirty" that you refer to is not so much something in a major sense, but that they needed something—

MR. LEDERER: I will object to the question as leading.

BY MR. PAFF:

Q Could you explain what you mean by "quick and dirty"?

A Yes. They wanted something that could be done relatively fast for not too much money and in a relatively simple manner. Primarily they were talking about something that wouldn't drag on for a long, long point in time. I guess we always referred to it as "quick and dirty," but [16] you might primarily refer to it or it might be a better way to call it just a relatively fast type of a study. It was meant to indicate that it wasn't to be a very long time-type of an assignment, just using existing information, a creation of no new data.

* * * *

[18] Q Now with regards to your initial study and those results, which are published in Exhibit 1, were you able to come to a conclusion?

A Well, as far as I know. They haven't been published yet but that's why I indicated initially they were handed in as a draft. We came to a number of findings, which we summarized on sort of a summary page there, indicating that the data seemed to show some contradictory [19] information and we indicated at the bottom of that summary page, if my memory serves me correctly, that it seemed a little early to make any big findings relating to the relative safety of the two vehicles types. As far as we know there was no information available that seemed very scientific, that addressed that and we were not totally satisfied with what came out of this study. I think I will stop at that.

* * * *

[20] WITNESS: I don't think I said we couldn't draw any conclusions, I said that, as far as the overall safety of the two vehicles, we did make some specific findings, but our overall feeling was that—and I should indicate that this is not unusual, most researches usually find that more research is in order and that's exactly what we felt to adequately address the situation with all of the rigor, scientific rigor, that one would like to see, we felt that more work was in order.

BY MR. PAFF:

Q But as a result of that examination of data you did reach some findings, did you not?

A Yes, we did. And they are listed here. This relates to the State of California in 1974 and relates to some ninety-seven thousand three hundred eighteen miles of roadway, which was patrolled by the California Highway Patrol. We reported that. And now I am quoting from what was indicated as the "preface" on Exhibit No. 1: [21] "There was an apparent relationship between accident severity and vehicle type. Doubles were over involved in the most serious accidents—and then we put in parenthesis (fatal and severe visible injuries). This means they had more accidents producing more serious injuries than would be expected from their representation in the overall vehicle population—and then in parenthesis (their exposure to risk or presence on the highway). Tractors with single trailers conversely were under-involved in the most serious truck accidents." I would say those were the primary findings. We made a number of other statements relating to under and over involvement of particular types of trucks and in particular types of collisions and we concluded with the statement that, in relation to the other findings that I have just alluded to, "None of these differences are large enough to be statistically significant. What we are trying to show is that the situation is complex. Generalizations about the overall safety of one class of truck versus another are not readily apparent and ought not to be made."

Q And this was your initial draft?

A Yes.

Q Now with regards to fatalities did you also [22] break out the conclusions with regards to merely those fatal accidents you studied?

A Yes. I think we did. We had conclusions I believe that related to the accident rate for both singles and doubles, for both fatal accidents and the accident rate for fatalities for each of the two types of vehicles.

Q And what was the difference in those two?

A I think we found that the rate, for what we referred to as doubles, was higher for both types of accidents, but not significantly so in the terms of fatal accidents, but significantly so in terms of the number of fatalities involved.

Q Now was this based upon motor vehicle miles?

A Yes, truck mileage.

Q Now when you refer to "doubles" in your study, what type of vehicle are you referring to and are there tables in your study which indicate those types?

A Yes. I will look it up. Specifically, we refer to a tractor pulling two trailers and I think I can indicate the way that that was coded by the California Highway Patrol who provided the accident data.

MR. LEDERER: Page 34 did you want? The pictures on [23] page 34?

MR. PAFF: He is still on the first draft.

WITNESS: No. It is not that. This is for the exposure data, which is the way the F.H.W.A. calls it out. The California Highway Patrol has a different coding scheme—okay? Something that they coded as a "25-33" we considered to be a double, which was a tractor plus two trailers. We did not consider a truck pulling two trailers to be a double, although some people do, we strictly considered it a tractor with two trailers behind it, which is coded by the California Highway Patrol as a "25-33".

BY MR. PAFF:

Q And what would the overall lengths of that vehicle be?

A This would be pretty much of a guess on my part, because I don't know.

MR. LEDERER: Don't guess if that is all you can do.

WITNESS: I think in California they are usually running 27 foot doubles, although I am not really sure and I don't know how long the tractor would be in addition to that and how much overlap there is on the different units. Certainly it varies depending on a number of factors. [24] I really don't know. I don't know if a typical double is a particular length in the State of California.

* * * *

[35] EXAMINATION BY COUNSEL FOR PLAINTIFF

BY MR. LEDERER:

* * * *

[41] Q Would you have counted a 532200 as a double in your study indicating exposure data?

A 532200? According to what we have here as doubles in the exposure data, we considered the 532200 as a double.

Q Okay. And that has how many axles?

A According to this that has seven axles.

Q And would you consider a 5322 then to be a double?

A Excuse me. The number again?

Q 53200?

A I don't see it down here in the vehicle types.

Q Is there a column labeled "others"?

A There is a column labeled "others" and that was—

Q Included in the doubles?

A Included in the doubles? That might have been in there. I don't remember.

Q Directing your attention to page 18 of the final draft, there is a column labeled "532400" and it indicates four vehicles—

[42] MR. PAFF: Slow down, John.

WITNESS: There is a column 532400?

BY MR. LEDERER:

Q Yes. It is in the doubles. Would those have been counted as doubles?

A It seems as if they would have been as far as the weight data was concerned anyway. I don't know if they would have been counted doubles if they were indicated, you know, in that description on that other page or as those vehicles for exposure. You know, as being counted as doubles. If it called out a 532400 then if it would have been considered a double or as far as exposure.

Q But can you ascertain whether it was or it was not?

A No, I can't. I don't know if it was considered among the others or not.

Q How many axles does that type of a unit have or this 532400?

A According to this coding it would have three axles on the tractor unit, two axles on a semi-trailer unit and four axles on a final trailer unit for a total of nine axles.

* * * *

[45] Q Your exposure data then did not merely compare sixty-five foot van-type, five axle twins with fifty-five foot, van-type semis, did it?

A We did not attempt to do that and I would assume that it did not do primarily that.

Q It certainly wasn't the purpose of this study?

A No.

Q So would this exposure data then permit conclusions applicable to a comparison of just sixty-five foot, five axle, van-type twin trailers with fifty-five foot, van-type semis?

A I think that one might take some inferential data out of this. It was not meant to do that at all.

* * * *

[57] Q Let me ask you, if you would, to take a look at [58] page 16 on the final report. What was the percentage distribution of the counting stations between urban and rural?

A I think you have to go back to the first study, but I think as we have indicated, 4/15ths were urban and 11/15ths were rural. Whatever that works out percentagewise.

Q Okay. I think the percentages are given up there in paragraph 1?

A Oh, let's see. Counting stations—Okay. Twenty-seven percent urban and seventy-three percent rural.

Q Let me simplify this and ask you, if you would read what has been marked as Plaintiff's Exhibit 2 in the deposition of Mr. Freitas—

A Do you want me to read all three pages?

Q I think if you get from the first page down the middle of the second page you are there.

MR. PAFF: We will take a short break.

[BREAK.]

BY MR. LEDERER:

Q Back on the record. Mr. Reiss, did the Government [59] provide you with sufficient money and sufficient time to permit you to do extensive cross-checking of the data which was supplied to you?

A I would say, no. I would say there was a considerable rush particularly in the time area.

Q Referring to Plaintiff's Exhibit 2 and the calculations made in those exhibits, which you have had an opportunity to examine, is it true that twins formed a larger part of the total twin, double population in rural areas than they did in urban areas? Just a moment. I may have misstated that. I am sorry. I did misstate that. Let me restate that.

Using the terminology singles and doubles, did doubles form a larger part of the doubles and singles total population in rural areas than they did in urban areas?

A Okay. According to these numbers in this table here, on the bottom of the exhibit which I have checked out, one of about twelve numbers and that number was accurate, assuming that these numbers are indeed accurate—Wait a second. You asked for—Okay. Doubles make up twenty-four percent of the truck population in the urban [60] area and thirty-six percent of the truck population in the rural area so that they make up a larger proportion of the truck population in the rural area than in the urban area.

* * * *

Q All right, sir. Now the highways, from which [61] your accident reports came, the California Highway Patrol Highways, what percentage of them are rural?

A I could look it up in the study, but they are primarily rural. Probably ninety some odd percent rural.

Q Referring to page sixteen of the final copy and numbered paragraph 2 there?

A Ninety-eight percent rural according to what it says.

Q And the only accidents you said were accidents that came from the California Highway Patrol highways?

A That is true.

Q Would it be a reasonable conclusion then that twins might fare worse in your study, because there is a higher representation of twins in rural areas and that's where all of the accident reports came from?

A One might interpret it that way. I wouldn't necessarily interpret it that way.

Q How would you interpret it?

A I would interpret it for the State of California. The only data source available, as to accidents in California, comes from the California Highway Patrol and this is a representation of the accidents experience [62] by the California Highway Patrol that puts together the accidents in California. My feeling is that this is a true representation of the accident experience in the State of California, on the roads patroled by the California Highway Patrol in 1974 and once you get beyond those kinds of roads it is a point of conjecture, because I don't know who is gathering up those other accidents.

Q But your vehicle exposure data is not based on the California Highway Patrol highways?

A That is correct. Because we tried to adjust it for that and it may be a good adjustment or it may be a bad adjustment, but we tried to adjust it to those roadways.

Q When you adjusted it to "those roadways," did you make an adjustment for the fact that twins are more prevalent in rural areas than in urban areas?

MR. PAFF: I will object to that as assuming a fact not in evidence. You can ask it hypothetically I think.

BY MR. LEDERER:

Q Go ahead and answer it.

A We did not attempt to do any adjustment as to the vehicle population distribution other than what we got from the counting stations of the California Highway [63] Patrol.

Q And those counting stations did show twins to be more prevalent in rural stations than in urban stations, is that correct?

A That's correct.

Q Using this data and if you had sufficient time and sufficient money to permit extensive analysis of the data and permit extensive manipulation of it, would it be desirable to correct for such factors as the over-representation of twins in rural areas?

A If one had some indication of what that over-representation truly is one could do that, but given the existing data that we were working with, I don't see any intelligent way to reasonably adjust these figures. I think what we had done is everything logical and reasonable. There is some assumptions made or conjectures in these numbers we have here in this exhibit and I don't know that his assumptions were any better or worse than our assumptions.

* * * * *

[74] Q And the purpose of your study was not to compare [75] sixty-five foot long twin trailers with fifty-five foot semis, was it?

A No. That was not the purpose of the study.

Q Mr. Reiss, are you, yourself, willing to state that that study, to a reasonable professional certainty, states the relative statistical safety of sixty-five foot, five axle, van-type twin trailers in California compared to fifty-five foot, van-type semi trailers in California?

A No.

Q Would you sponsor this exhibit and proffer it to the Court as an accurate representation of the comparative statistical safety records of sixty-five foot, five axle, van-type twin trailers compared to fifty-five foot, van-type semis?

* * * *

[76] WITNESS: I would have to answer, no, in that we did not address truck type or length in this study. We just addressed the inherent safety of singles versus doubles.

* * * *

[78] REEXAMINATION BY COUNSEL FOR DEFENDANT, RAYMOND KASSEL, et al.

BY MR. PAFF:

Q I have a couple more, Mr. Reiss. Was it your [79] testimony that you could make some inferences from the data that you supplied in your report with regards to the differences between a sixty-five foot, double bottom and at fifty-five foot, single?

MR. LEDERER: You are asking for inferences and not for professional opinion and to the extent you are asking what is in the record, it is in the record and you cannot ask an expert for inferences; you can ask him for his opinions.

BY MR. PAFF:

Q Would you have an opinion as to the differences and how this study would relate to those?

A I know that, what is referred to as the two axle tractor, with the one axle semi-trailer and the two axle full trailer, is the most common truck that's involved in the California accident data as a double. I believe, although I am not sure, that the trailers are normally twenty-seven feet long. I have no idea what the overlaps are and what the final length of the double is and I am not really sure of what the length of the most common single is, which is a three axle tractor with a two axle trailer. If it turned out that the most common double in California was a sixty-five foot, van-type double and [80] if it turned out that the most common single in California was the other one, was I guess, a fifty-five foot, then perhaps you could use this in alluding to the overall safety comparison of the two vehicles, but I in no way know what the actual lengths of the vehicles typically run in California are.

Q So if we assumed that the double, that is portrayed and set forth in your study under the heading on page 18, at 521200, which is the seven hundred observations which you made and if we assume—and I will ask you to assume, that the length of that double in 1974, the most common length was sixty-five feet and the single that you spotted, which is 332000, had the most number of observations or on "Table 4," is that correct and had an overall length of fifty-five feet, could you then use your study to make those conclusions that are in all four reports, essentially, regarding fatalities per vehicle mile?

A If those were the most common types of both vehicles then I feel like you could apply the general conclusions we have come to about those separate vehicles in California Highway Patrol monitored roadways in [81] California in 1974, but those conclusions indicated there was no significant difference in the accident rates of the vehicles or in the fatality accident rates, but merely in the number of fatalities that are observed per a given distance covered by each vehicle type, when they were significantly more for those vehicles that we had classified as doubles.

Q And in response to Mr. Lederer's question about being uncertain with regards to the full impact of what you did in your studies, did that relate to your specifically not being able to verify the fact as to the actual length of each truck that you made an observation on?

A That's true.

* * * *

JURAT

* * * *

DEPOSITION OF R. D. FOGO

Filed February 8, 1979

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

QUESTIONS BY MR. PAFF:

Q Would you state your name, please?

A R. D. Fogo.

[4] Q And what is your address, Mr. Fogo—business address?

A Box 18007, Southeast Station, Wichita, Kansas 67218.

Q And who is your employer?

A The Kansas Turnpike Authority.

Q And is that at the same address as you mentioned before?

A Yes.

Q And how long have you been so employed by the Kansas Turnpike Authority?

A Since June, 1966.

* * * *

Q And what are your primary duties with the Kansas Turnpike Authority?

A For the last three years, I've—I have been Chief Engineer and General Manager of the Kansas Turnpike Authority, responsible for all of the administrative operations of the Authority.

* * * *

[10] Q And when you do close down the turnpike, you—what would the overall length of that combination be?

A Well, it's—I guess it's theoretically possible we could close it down to all truck traffic. I don't recall of any recent closings for all truck traffic—perhaps Captain Gillies can recall of some—but most of our closings, and they've been relatively few times, have been to the double bottom traffic.

* * * *

Q So it was your testimony, just to be perfectly clear on this point, that you do at various times close the road to the double bottom configuration despite its length and not to the semitrailer combination, the eighteen wheeler that you've described?

A Yes, I believe that's correct.

* * * *

[14] CROSS EXAMINATION

QUESTIONS BY MR. LEDERER:

* * * *

[Q] What different lengths of doubles use the Kansas Turnpike?

A Well, we have a tractor-trailer and two twenty-seven foot trailers which constitute one type. We have a tractor-trailer—a tractor unit and two forty foot trailers. And then we would allow three trailers and a tractor unit. Any combination of these trailers cannot exceed 108 feet.

Q I see. The tractor and two forty foot trailers would still be referred to as a double?

A Yes.

* * * *

JURAT

* * * *

DEPOSITION OF HOWARD GILLIES

Filed February 8, 1979

[Caption Omitted in Printing]

* * * *

[3] DIRECT EXAMINATION

QUESTIONS BY MR. PAFF:

Q Would you state your name for the record?

A Howard Gillies.

* * * *

Q As part of your duties—well, could you describe for the record your duties?

A I'm the commander of Division 7 of the Kansas Highway Patrol which consists of the Kansas Turnpike. I am responsible for the enforcement on the turnpike.

* * * *

[5] Q Okay. What function do you play, sir, in the closing down of the Kansas Turnpike during inclement weather?

A Recommendations.

Q And what safety considerations do you take into account when making such a recommendation?

A If the trooper that is actually in the district feels that the road is in such condition that a double or triple bottom unit cannot operate safely, then he will recommend to me and I'll pass it on that they are to be closed to this type of unit.

Q And you were present in the room when Mr. Fogo testified with regard to closing down the road to the configuration of a sixty-five foot double, a sixty foot double and it's left open to the tractor-trailer semi. Is that your understanding too?

A Yes, that is correct.

Q And approximately, if you can, how many times would that occur during a given period of time?

A It's very difficult to say, because it varies from year to year. Possibly on some years it may not happen at all. Other years, it may happen five, six, seven times. It completely depends on the road condition and the weather, which is unpredictable.

Q And what—just briefly could you describe the road conditions and the weather that would indicate—

[6] A If we have roadway surface that is completely covered with ice that has not been treated, we'll close it down. Or if it gets covered with snow to such a depth and generally wind is drifting the snow on the roadway at this time, we might close it down at that time.

* * * *

Q Is there anything unique about the turnpike in being able to control that type of situation?

A Yes there is, because we do have the gates where we can shut the traffic off. With the other systems, it's almost impossible to do so.

Q And why would it be impossible?

A You don't have the point of—or one particular spot that all traffic must pass through such as we do have in a turnpike system.

Q Is it a matter of safety also of other users of the turnpike that you do close it down?

A Yes, it is.

* * * *

[8] CROSS EXAMINATION

QUESTIONS BY MR. LEDERER:

* * * *

[9] Q I see, sir. So I understand correctly, the rates per hundred million miles—well let me go back for a second.

If we're talking just about the Class 6 twin trailer or the sixty-five foot single axle twin trailer unit, that would be—any accidents occurring to that unit would be

[10] recorded as an accident under the double bottom and triple combination heading in your report?

A That's right.

Q However, miles driven by that unit would not be recorded under the double bottom and triple combination heading in your report?

A That's true.

Q So your report would make no conclusion or would permit no conclusion in regard to the accident rate per million miles of the single axle sixty-five foot twin trailer unit?

A Well, we don't break down a sixty-five footer from a 108 footer. It's number of trailers.

Q I see.

A And in answer to your question, that's true.

* * * *

[11] A If I might, I would like to clarify a little bit on the answer to the first question. I think probably on a two lane roadway there would be some difference in the length, but on a four lane where you have one lane open, I can't see where there's any difference.

Q There's—if there's no—what you're referring to there is passing?

A Passing, that's correct.

Q So there certainly would be no—I would assume from that, if we compared a sixty-five foot twin unit with a fifty-five foot semi, you would see no appreciable difference in passing safety, so long as you're on a four lane limited access highway?

A That's correct, that's correct.

* * * *

[13] Q I see.

A And there isn't any other practical way that we can do it [close the highway].

Q So basically what you've done is for—out of administrative necessity, you've used a general classification, simply to be all doubles and triples will be off the highway?

A That's correct, that's correct.

Q And I assume it's very easy for the tollbooth collector to look and see whether it's a double or a triple?

A That's correct. If he's got two, three trailers, whatever, that's correct.

Q And it probably would be difficult for him for instance to judge exactly what the length of the unit would be.

A That's certainly true. And he doesn't have time to do this.

* * * *

DEPOSITION OF U. C. JONES

Filed June 28, 1979

[Caption Omitted in Printing]

* * * *

[3] MR. PAFF: The witness has been designated as a defendants' witness in this particular proceeding. However, by agreement of counsel Mr. Jones will be questioned initially by Mr. John Duncan Varda who represents the plaintiff in this matter.

* * * *

EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name for the record and give your business address?

A U. C. Jones, Roadway Express, Lincoln Highway, Chicago Heights, Illinois.

Q And what is the nature of your position with Roadway Express?

[4] A Vice-president, Northwest Division.

* * * *

[6] Q What is the business of Roadway Express?

A Roadway is a general—it's a common carrier handling general freight.

* * * *

[8] Q Have you had an opportunity to look at the sworn testimony of James A. Schlueter in this proceeding?

A Yes. I have.

Q And do you recall reading in his testimony a description of general commodity operations of Consolidated Freightways?

A Yes.

Q Are your operations basically similar to those of Consolidated Freightways?

A Well, we don't use the doubles. We do not use double trailers. The system is pretty much the same. We perhaps have developed a breakbulk system that's a little bit—because of our use of semis, a breakbulk system that's a little more complex or a little more extensive than perhaps C. F., but it sounds the same, very much the same.

* * * *

[12] Q Does your company have an opinion as to whether a relay system is the best alternative type of operation?

A I would say that it is the best operation, yes. If you're asking that in the context of would we go back to sleeper if the costs were there, I'd say no. I don't think we would. I think the relay is absolutely the better of the systems.

Q From your experience in the industry, is a relay operation typical or untypical of general commodity operation?

A Relay is a typical operation.

* * * *

[17] Q Do you see any advantages in the use of twin trailers for long-haul general-commodity operations?

A Yes. I think that twin trailers should be very desirable. I think that they could if properly used be able to eliminate perhaps a breakbulk handling by say—let's say that in your example a moment ago, Los Angeles going to Valdosta and a shipment which was picked up for Jacksonville.

If you were using smaller trailers, twins, you might be able to make a Jacksonville direct from Los Angeles rather than loading everything to Valdosta for [18] rehandling and going to Jacksonville.

So, you would gain there in rehandling. You would gain in the reducing the exposure for O S & D problems.

Q Explain for the record what O S & D is.

A Creating any overages, shortages or damages to the shipment when it is being rehandled.

You could gain in service in that let's suppose that not only Los Angeles did this but Dallas did the same thing, and both those trailers could then be married let's say in Valdosta. And it would be quicker to put two smaller boxes together in Valdosta and proceed on to Jacksonville as it would be to unload a portion of a Jacksonville headload and then reload it and then add freight to it going to Jacksonville. So there would be a service gain there also.

Q Did you have an opportunity to read Mr. Schlueter's testimony with respect to the desirability of using twin trailers for general commodity operations?

A Yes. I did.

Q Did you have any dispute with his views as to the desirability of twin trailers for general commodity service?

A No. I would not—I did not find anything that stood out that I would take exception to.

Q Given all that, can you indicate why it is that your [19] company does not use twin trailers at the present time?

A We do not use them because we attempted to do so when we first took over Western Gillette, and we had a great deal of difficulty with rehandlings, number one, moving into the semi area.

We have a problem with compatibility, which I feel is even greater than perhaps the rehandling costs. When you have varying types of equipment that do not intermesh or they do not fit, we invariably find that we can't make it work.

You have to keep the systems separate, and when you have a complete movement of freight across the country, you're going to end up with equipment in the wrong places at the wrong times, and it just hasn't worked for us.

Q What is the principal difference between twin equipment and semi power equipment?

A Well, one, basically you have a different tractor. You have a single axle verses a tandem which we use. You have the differences in the trailers themselvs.

* * * *

[21] Q Were you not restricted with respect to equipment type and able to lawfully use 65-foot twin trailers throughout your system, would your company use that type of equipment?

A Yes. They would.

Q Is the 65-foot twin trailer the common twin trailer unit used by general commodity carriers?

A Yes. It is.

Q Is the 60-foot twin trailer a common unit used by general commodity carriers?

A Apparently not. I'm not that exposed to them, but apparently it is not the common size.

* * * *

[22] EXAMINATION

* * * *

BY MR. PAFF:

[23] Q Mr. Jones, I know this is a pretty difficult position for you to be in, but do you directly compete with Consolidated Freightways?

A Yes.

Q Did you directly compete with Consolidated Freightways for traffic prior to 1977?

A Oh, yes.

* * * *

Q So, prior to 1977, if I were a shipper in Des Moines, an LTL shipper, I could call Roadway Express or I

A No. We couldn't offer you the same service because

could call Consolidated Freightways, and you would offer me the same service to say San Francisco?

A No. We couldn't offer you the same service because we would have to interchange.

[24] Q But you could offer me the same delivery?

A We could offer you a service to a point where there would be an interchange. We could probably not offer you the same service in terms of in transit time.

Q But I could get my goods from Des Moines?

A You could get it moved, yes. If that's your question, yes.

Q And I could get that moved in your equipment, could I not, at least—

A Only to the point of interchange.

Q But through a system of interchanges I could get my goods to a particular point anywhere in the United States?

A Yes, if a motor carrier served it. I'd have to answer it that way. There may be points that motor carriers don't serve. I don't know.

* * * *

[26] Q In 1978, if I called you in Des Moines would you offer the same rates to San Francisco from Des Moines as Consolidated Freightways would?

A Generally speaking. There may be rates that—volume rates that C. F. may have that Roadway would not have, that we would not be participating in. There could [27] be differences in our rates, yes.

Q Are you a member of the Midwest Motor Freight Tariff Bureau?

A Yes, as—yes.

* * * *

Q So, the space on the back-haul would not be critical with regard to any particular length of vehicle, would it?

A On the back-haul?

[28] Q Yes, sir.

A Yes. It would be.

Q And why?

A It would be critical—let's see, we would want to load a full trailer from the West to the East using every bit of the cube we could because the empty that would move from the West would be short-stopped somewhere in the center, and that cube would be used, okay?

* * * *

[29] Q In other words, what I think might be a long-haul carrier might be different from what—

A In my view, yes. I've always thought of Roadway as a long-haul carrier, but when you talk about C. F., they say they're a long-haul carrier. Their length of haul was substantially longer before we got into the West Coast market than ours was, yet we defined ourselves as a long-haul carrier.

Q So you're both long-haul carriers?

A Yes.

Q Now, the advantages of twins that you went through there, and I notice you qualified those with the term could, aside from the additional cubic capacity that you could get [30] with the five additional feet, would these same things that you described regarding rehandling, the O S & D charges, and the potential service advantages be available to a user of 60-foot twin combinations also?

A Except for the fact that you deprive us of that additional cube.

Q My quetion left out just that portion of it. But assuming everything else as being equal, would the same theoretical advantages that you described work with the maneuvering of smaller boxes, too?

A They would, but would they offset the loss in cube would be the only question I would ask, and I don't think they would. As a matter of fact, in my view they would not.

Q And have you done—

A Because our greatest expense is the line-haul portion of our operation, that's where our greatest expense lies. So, the more we can—the more traffic we can move with one trip, the more economical we are operating.

* * * *

[31] Q What dictates the length of your equipment?

A Well, I'm sure that law dictates the length of our equipment. Now, you know, up to a certain point, I don't know where that point is, where it's going to be impractical to make—I don't know how long a trailer could be made engineering-wise that would be a safe length as opposed to the stress on the length of the units and so forth. I don't know how long that could be. But law is what dictates the length of our equipment, height and width.

Q And would that create the industry standard?

A I would suppose—yes. I would say that it would.

Q Now, with regard to the direct competition that you have with Consolidated Freightways and with regard to the use of your equipment, are you able to operate within the current length limits of every state of the United States?

A Are we able to operate within the length restrictions. Yes. We are.

Q And you now use exclusively semi equipment?

A Yes. We do.

* * * *

EXAMINATION

[32] BY MR. JOHN VARDA:

* * * *

A Interchange may be the interchange of equipment as opposed to interline being the giving of a shipment from one carrier to another carrier, okay. That would be the only thing I could think of.

Q Is the word interchange typically used to denote an interchange of equipment and freight while interline is typically used to denote interline of freight without equipment?

A Without equipment, okay.

* * * *

[33] Q I think Mr. Paff gave you an example of a movement from Des Moines to a West Coast point prior to your acquisition of the Western Gillette operation, and you indicated that the shipper could get it moved.

I'm interested in knowing whether you feel that a shipper would typically have shipped in that fashion. If a direct carrier service was available, would you find yourself obtaining shipments for movement to an interchange point and then to the destination?

A It would not be to the shipper's advantage to use an interchange carrier, a two-line carrier or three-line [34] carrier, when he could get direct service.

Q What's the usual reason for that?

A Generally you're going to lose time in interchange —in interlining of shipments. You also have the exposure again to the O S & D aspects.

Q Now, you were asked a couple of questions about whether or not you could refuse freight. While you may not refuse freight, you may require a combination of rates to apply rather than a through single factor rate?

A That's correct.

Q And does the application of combination rates have some affect on the shipper's use of a routing?

A Absolutely. He would much prefer a through rate as to a combination rate.

* * * *

[37] Q You were asked a question about whether the law dictates the length of equipment which you operate. You operate 55-foot semis in Arizona and California for your operation. Those states would permit the operation of 65-foot twin trailers, right?

A Yes.

Q What law is it that dictates your use of 55-foot semis in the State of Arizona and the State of California?

A Well, we're back to the question of—we can't do that because of the economics of the rest of our system, the units going into and out of there where we are not able to use that size equipment. And so I see the point of your question, and you can't operate each state independent of the rest of the country.

Q Isn't it a fact that the laws of the states in which your principal traffic is originating and terminating dictate the length of your equipment even where longer [38] equipment is otherwise authorized?

A That is correct.

* * * *

TRANSCRIPT/TRIAL RECORD

[5] JOHN NIMMO,

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name for the record, and spell your last name?

A My name is John Nimmo, N-i-m-m-o.

* * * *

[6] What is your present position with [Iowa] the Department of Transportation?

A I am the Assistant Director, Office of Advance Planning.

* * * *

Q And what is the nature of your responsibilities?

A To perform various studies, state transportation plans, need studies, what we call special studies, which this would be one type that we're talking about here.

Q Okay. How long have you been employed by the Department of Transportation in any capacity?

A Including the Iowa Highway Commission experience before and DOT experience since 1975, 20½ years.

* * * *

[12] Q Can you explain, sir, what your role was in relation to the development of Exhibits 1 and 2 [*Sixty-Five Foot Twin-Trailers on Iowa Highways, Perspective,* April 1975]?

A I directed the study at the staff level.

Q When was the study conducted?

A January through April of 1975.

* * * *

[18] Q Were you given any instruction in conducting this study as to what result was to be produced as to favorable or unfavorable to the twin trailers?

A No.

* * * *

[24] Q And one of the first answers was that there would be no large increase in trucks as a result of authorizing 65-foot twin trailers?

A I don't remember saying that there would be no large increase.

Q Okay. May I direct your attention to Page 5?

A Okay. I can't argue with it.

* * * *

[25] Q And did you reach a conclusion that most of the traffic which would be affected by permitting 65-foot twin trailers in Iowa was presently bypassing the state on some alternate route?

A Would you restate that, please?

Q Let me rephrase the question. The additional traffic [26] which might be expected in Iowa, based upon your projections, is traffic which is now at the time of the study bypassing the State of Iowa?

A The majority that we would expect, yes.

Q Okay. It was the vast majority, was it not?

* * * *

A Okay. But we do qualify that with the "near future". We know these would occur immediately.

* * * *

[27] Q And that's the diverted traffic that goes all the way around the State of Iowa?

A No. That's the traffic that will be diverted to Iowa.

Q The diverted traffic at the present time moves all the way around—basically through Northern Missouri, right?

A No. I guess I don't agree with the statement that it is presently being diverted. It has never been allowed in Iowa.

Q It is the diverted traffic when it gets onto I-80 or into Iowa?

A Yes, because it is being diverted.

Q That traffic is now moving around the state?

A Yes.

* * * *

[31] Q What does the term "weight constrained" mean?

A If a vehicle is weight constrained it means that it reaches the maximum weight limit before this truck was totally full.

* * * *

[33] Q Was it your determination here that the weight constrained carrier is not likely to use a 65-foot twin trailer?

A Under existing legal limits for weight.

* * * *

[35] Q Didn't you find that the carriers that are operating 65-foot twin trailers were principally general commodity carriers?

A Yes.

* * * *

[47] Q Now, you did some work on Missouri statistics and accident records, did you not?

[48] A Yes.

Q You found no statistically significant difference between—among the twins of 60 feet, 65 feet and the semis, is that correct?

A No statistical significance.

Q To do that study, you actually went to Missouri and had someone look through the accident records themselves?

A Yes.

* * * *

Q (By Mr. John Varda) What was the reason for contacting other states?

A Twin trailers were allowed in 28 states at the time. We figured this would be a good unbiased source of information.

Q Your results speak for themselves, but I am interested in did you give particular reliance to what the other states told you?

[49] A I don't know as it could be stated that way. We merely surveyed the states, and then presented what we found.

Q Did you find that the representatives by the states that you contacted provided some kind of check on the other analyses that you were doing relative to statistics and trucking company responses, and so on?

A Are you talking strictly about safety here?

Q Yes, sir.

A Okay. I think it essentially bears out what is clear from practically every analysis we have made; the safety question is still up in the air.

Q Well, sir, may I direct you to Page 53. The last paragraph there says that "It appears from the data gathered that doubles are at least as safe as semi trailers in terms of accident frequency, and are a more maneuverable vehicle than the tractor semi trailer."

Isn't that what your staff concluded from the contacts with the other states, as well as the other data in the safety section?

A Yes.

Q Your staff did reach a conclusion?

A If you can call it—It appears that, yes.

* * * *

[51] Q (By Mr. John Varda) Let me refresh your recollection. If you would, look at Page 73 at the very bottom, the last paragraph. I didn't use exactly the same words, but perhaps it is better saying the observations and comments from other state officials were considered a very important influencing factor in your analysis? Is that a fair statement?

A It would have gone into our making the final decision that we couldn't prove them to be less safe.

* * * *

[59] Q The typical unit would be the 65-foot unit, is that correct?

A Not in Iowa.

Q Otherwise?

A Yes.

* * * *

[66] Q Can you give any safety reason—and I mean a non-speculative factual reason—why Iowa should allow 60-foot twins but exclude 65-foot twins?

* * * *

A The only one I could think of would be length.

* * * *

Q (By Mr. John Varda) I guess I don't think length standing by itself stands as a safety reason. Can you explain how you would consider length to be a safety reason?

A It takes longer to pass the 65 than it does a 60.

* * * *

[67] Q (By Mr. John Varda) Sir, if you will address Page 60 of the report, do you not conclude and does the report not conclude that the data does show that the slight increase in length has no significant impact upon the passing distance?

A Based on historical speeds, yes.

Q These are based on—Strike that.

Do you mean to say here that the fact that you could not prove 65-foot twins to be as safe or safer leads you to the statement that no conclusion can be reached?

A No. We reached the conclusion that we couldn't prove them to be less safe.

Q Is reaching the conclusion you can't prove them to be less safe the same as saying that the question is totally up in the air?

A Yes, I think it does. It is a three-part thing. You can either prove they are not less safe. You can prove they are as safe or more safe. We couldn't prove that they were as safe or more safe.

Q Do you say that anywhere in the report?

A No. We didn't have the information to say it, or we couldn't conclude that there was any. The only thing that we could state for sure was that we couldn't prove that they were [68] less safe.

Q This report was made for some party, whether the Transportation Commission or the Legislature, to read and rely upon, was it not?

A Yes.

Q Wouldn't it have been a significant piece of information to provide, if you felt that no conclusions could be drawn from the report?

A The report was—We drew conclusions where we could. The report is an information report. It is not a recommendation report.

Q But if you felt that a person should not rely on the information in the report, would you not have felt that was a significant piece of information to provide in the report?

A I don't follow. I don't think there is anything in the report that we couldn't expect somebody to rely on.

Q I didn't quite get that answer.

A Well, the report is an informative report. They can make their own decisions as to whether they want to rely on it or not.

* * * *

[71] Q There isn't something else that you now think you should have addressed that you didn't address, is there?

A Yes, there is one—something that we didn't know before, which is the Kansas Turnpike shuts down during icy conditions for the doubles and triples.

Q Okay. Any others?

A I think if we're talking about now new information since that time, that I think the 55 mile an hour speed limit should be something that should be looked at.

Q How would you think the 55 mile an hour speed limit is relevant?

A The speed differential between vehicles on the highway now is a smaller differential than it was previously, which means there is going to be a longer passing time because of the differential—smaller difference in speed.

Q Isn't the smaller differential in speed generally considered a favorable characteristic for safe operations?

A Yes, but not necessarily related to passing.

Q Don't you have to have the speed differential to pass another vehicle?

[72] A Yes.

Q Isn't it correct that as the speed becomes slower, the differential will tend to become greater?

A No; unless I misunderstand the question.

Q The slower speeds of the stream of traffic, don't the passing differentials and actual experience tend to become greater than they would with a faster speed in the stream of traffic?

A If you are using an average speed differential, every time it comes closer, it's going to take longer to pass.

Q You have more ability to accelerate for passing at 55 miles an hour than you do at 70 miles an hour, do you not?

A If you are looking at it strictly from an acceleration standpoint.

Q Now, in reviewing all available reports on accident statistics, you were able to locate no figures which showed a significant difference in accident experience among 65-foot twins, 60-foot and 55-foot semis?

A No statistical significance.

Q Did you find any statistical difference that favored 65-foot twins?

A Nothing of statistical significance.

Q Did you conclude and did the report conclude that as far as braking performance, passing distance, maneuverability, splash and spray characteristics and aerodynamic disturbance [73] characteristics that there would be no sacrifice to safety in allowing 65-foot twins to operate in the State of Iowa?

A I don't know as we made that as a conclusion. I remember a statement in there saying that there seems to be no sacrifice. If you are referring to a specific statement, I would respond to that.

* * * *

[74] Q Do you want to read that statement so we know for sure what you are looking at starting with the "analysis of braking performance"?

A "The analysis of braking performance, passing distance, maneuverability, splash and spray characteristics and aerodynamics disturbance characteristics yielded no areas requiring sacrifice to safety."

* * * *

[76] Q But you did reach a conclusion that there would be more accidents—More accidents is a measure of safety, is it not?

A Right.

Q There would be more accidents by continuing the operation of 65-foot twins on roads in Missouri than having them diverted, as you would say, to the interstate highways in Iowa?

A Because of the vehicle miles being traveled to go around Iowa, yes.

Q How did you manage to reach that conclusion if you feel that the safety of the 65-foot twins is completely open to question?

A What conclusion are you attributing to me at the [77] moment?

Q You reached the conclusion that there would be more accidents. It would be less safe to continue operation of 65-foot twins on highways in Missouri than to divert that traffic to interstate highways in Iowa.

A Okay, because of the vehicle miles, but that was a legislative decision on the part of Missouri to allow those trucks. I am sure there are other legislative decisions to be made that make the same reduction in other areas.

Q But you reached the conclusion that it would be safer for these vehicles to operate in Iowa?

A Obviously, because it would be on the interstate.

* * * *

[78] Q How did the Kansas turnpike study come to your attention?

A Through discussions with legal counsel.

* * * *

Q Do you know whether it [the Kansas turnpike study] is an accurate portrayal of the [79] relative accident rates and safety of 65-foot twins to other vehicles?

A No, I do not.

Q Really, if it is a factor that may be new information to consider in connection with the type of study you have done, you are really speculating on what it shows, are you not?

A Speculating on what this shows?

Q The Kansas study shows.

A Yes, but when you asked me the question before, I said that those were things I would look at. I didn't say I knew the answer.

* * * *

[82] Q The rigid pavement formula is the appropriate one to use in addressing the subject of 65-foot twin trailers in the State of Iowa?

A I think it is appropriate, yes.

* * * *

[83] Q Isn't it the interstates where you have projected the predominant volume of traffic of 65-foot twins would occur?

A Yes, predominant additional traffic.

Q The report concludes that the benefits—there would be benefits to Iowa industry and others located in Iowa as a result of having 65-foot twin trailers in the state.

A Yes.

Q Those benefits would be less than benefits to others?

A Yes.

Q The primary beneficiaries would be interstate interests or people located outside of the state?

A Yes.

Q On the road wear issue, permitting 65-foot twin trailers in the state of Iowa would result in more road wear?

A Yes.

Q Would the state garner sufficient tax and other revenues to offset the increased cost of that road wear?

A The state, not necessarily, no.

Q Would sufficient revenues be generated to offset the additional road wear?

A If properly re-allocated, yes.

Q Didn't your study conclude that the revenues from the additional traffic would exceed the added cost of added road wear by something more than $4 million?

A In total, yes.

[84] Q So what do you mean by it wouldn't be offset? Can you explain that?

A This is a report for the information of the Legislature, and they realize that we have distribution of road use taxes within the state. Forty-five percent of that goes to the state highway system, 37 percent to the counties and 23 percent to the cities. Any revenues generated by the 65-foot twins would be distributed 45 percent back to the system on which the wear occurred. It would take further Legislative action to get all of that money back into the system where the wear occurs.

* * * *

Q Would there be a net decrease in road wear, considering both Iowa and other states, as a result of authorizing 65-foot twin trailers in the State of Iowa?

* * * *

Q Wouldn't the decrease in total mileage indicate a decrease in road wear?

[85] A Yes.

* * * *

Q Based on this report, is it not true that a 65-foot twin trailer at the same gross weight as a 55-foot semi trailer produces less road wear?

A Yes, same gross weight.

Q In fact, it is true that a semi trailer vehicle loaded to some 63,000 pounds would produce about the same road wear as a 65-foot twin trailer loaded to 65,000 pounds?

A I believe that's a correct approximation.

[86] Q Where you estimated an increase in road wear in the State of Iowa, that increase was solely related to increased traffic volume as opposed to an increase created by the nature of the vehicle involved?

A Yes, by additional trucks.

THE COURT: Just out of curiosity, is that difference accounted for by the separation of the axles?

THE WITNESS: It has to do with the axle loading on the pavement and the spacing, yes.

Q (By Mr. John Varda) Now, the final area I would like to look at is, if you—Maybe we can do this just addressing the conclusion.

Your report concluded, did it not, that there would be no diversion of traffic from the railroads as a result of authorizing 65-foot twin trailers in Iowa?

A I can't state that we said no diversion, but I would go along with not much diversion.

Q And can you explain the reason for that conclusion?

A The reasoning behind it is that the railroads are not typically hauling the same type of freight as the twins would haul.

* * * *

[87] Q There would be a diesel fuel savings by permitting operation of 65-foot twin trailers in Iowa?

A There would be a diesel fuel savings nationally. There would be an increase in Iowa.

* * * *

[89] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[92] Q In you discussion with Mr. Varda on the road wear section, you used the calculations with regard to concrete pavement, did you not?

[93] A Yes.

Q Now, do you know if the calculations and the formulas change with regard to road wear when we discuss asphalt pavement as opposed to concrete pavement?

A It should not change. We are talking about comparable pavements, comparable pavement design.

* * * *

Q So would it be a fair statement to say that you concluded that there would be additional traffic accidents and deaths in Iowa as a result of the diversion of traffic from Missouri back to Iowa?

A Yes.

* * * *

[94] CROSS EXAMINATION

BY MR. BITTNER:

Q For the benefit of the Court, Mr. Nimmo, this report is captioned a 1975 report. The figures on which it is based are 1974 figures, is that not covered?

[95] A It would be basically 1974 or the latest available which means some would be back further than that.

Q So we are talking about figures that are in excess of five years old and which have been updated only in the area of determining an increase in the number of truck trips from 206 to 228 to 230, is that correct?

A Yes.

Q That's on a per-day basis?

A Yes.

Q Does that same percentage increase relate to the mileage that was projected? I believe that this study projected an additional 20 million miles of travel on Iowa highways in those years, is that correct?

A Yes.

* * * *

[100] Q So those studies merely showed you that there were so many accidents per long truck without regard to whether it was 60, 65, 55, double-bottom or otherwise, isn't that true?

A It was normally stated as combinations, yes.

THE COURT: Do I understand that the reports did not make a distinction between a semi and a twin bottom?

THE WITNESS: Some very few states, I think, have records compiled by that breakdown. Most of them have the total group in which they call combination vehicles.

MR. BITTNER: I have nothing further, Your Honor. Thank you.

THE COURT: Redirect.

REDIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Mr. Nimmo, you do have an analysis of the returns from the various states which breaks down those states which did respond with the distinction between 65-foot twin trailers and other combination vehicles, is that correct?

A Yes. I believe I said that some do, but the majority don't. Do you want to direct me to a page?

Q I just want to make it clear. I think it would be helpful to get a page reference.

MR. PAFF: 50 [of Exhibit 2].

[101] Q (By Mr. John Varda) At page 50, does that reflect which states responded in which manner, or the numbers?

A Yes. We say that 11 states responded that a breakdown of accidents between 65-foot, 60's and semi trailers was not available.

Q Other states did respond with a breakdown, and you analyzed those responses, is that correct?

A To the extent that we could respond or analyze, yes.

Q With respect to Missouri, you went down and made your own analysis of the breakdown for the respective units, is that correct?

A Yes.

Q So far as you found this effort in contacting the states valuable, you found it valuable regardless of whether they were able to break down the statistics or not, is that correct?

A We found the information returned by the states valuable, yes.

Q Now, in some cases a state was not able to break down its accident statistics by 65-foot, 60-foot and 55-foot, is that correct?

A Yes.

Q Did you still rely on representations made by officials of those states?

A I don't think we did statistical analysis on state [102] reports.

Q But they made other representations in response to these questionnaries, did they not?

A Oh, I am sure we would have included those in our judgments or whatever analysis that we were making.

Q Well, for example, they responded that there was no noticeable increase in accidents when 65-foot twins were legalized, you would rely on that statement and give it consideration, would you not?

A We wouldn't say that it proved anything, though, significantly.

Q You would rely on qualitative statements in your analysis as well as quantitative statements, would you not?

A Yes, we would report it that way.

Q That's what you found valuable about the responses of the unbiased state officials, isn't that correct?

A Yes.

* * * *

[104] Q (By Mr. John Varda) Now, according to your calculations, as we have got it at Page 25, there would, regardless of the 10 to 12 percent increase factor —the result of operation of 65-foot twin trailers in Iowa would be a net decrease in accidents and a net decrease in fatalities?

A On a predicted net decrease because of that decrease in miles.

Q And to the extent that the volume has risen, the net decrease in accidents and net decrease in fatalities will have risen in the same way?

A Yes.

* * * *

[111] RAYMOND L. KASSEL

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name for the record, spell your last name, and give your address?

A Raymond L. Kassel, K-a-s-s-e-l, 913—11th Street, Nevada, Iowa.

Q And by whom are you employed?

A The Iowa Department of Transportation.

* * * *

Q And what is you current title?

A Director of Iowa Department of Transportation.

* * * *

[117] Q Are you a member of any societies or organizations of transportation engineers?

A Well, I am a member of the American Society of Civil Engineers with the grade of fellow, which is the highest grade [118] that is available in that organization. I am a member of the American Association of State and Highway Transportation Officials, and I am on their executive committee and chairman of their standing committee on planning.

* * * *

Q Now, if we can move into some specific areas, Mr. Kassel, is it true that the aerodynamic effect of a truck on a car in a passing situation is less with a 65-foot twin trailer vehicle than a conventional semi at 65 feet?

A What part of the report are you referring to?

Q I am not referring to the report.

[119] A Okay, okay. There has been extended discussions and studies on the aerodynamic effects of trucks,

and particularly as it relates to the configuration of the trailer and the load that is being carried on that trailer, and one of the things I found out is if you break the length of a long extended length and it breaks up that air flow through it, you may have less of an effect on the vehicle that you do if it is a constant side.

* * * *

[129] Q Would, for example, there be a net savings in fuel consumption and reduced miles of operation as a result of 65-foot twin trailers operating through the state of Iowa rather than arount it?

A Those figures are given in your Exhibit 1; that there is a net benefit in fuel savings to operate through the state.

Q I think the question was more directed to if there would be a net savings. Is that correct?

A The study indicated there would be a savings if 65-foots were allowed to operate in the state.

Q And do you agree?

A Yes.

* * * *

[130] Q Would the operation of the 65-foot twin trailers in the State of Iowa reduce accidents and fatalities in the State of Missouri?

* * * *

A Our study indicates there would be a net reduction.

* * * *

Q In that context, what do you mean by net reduction in accidents?

A That if you look at the total accidents in the corridors in which those trucks are operating and which they could operate, there could be a net reduction since you have a [131] net reduction in vehicle miles of travel.

* * * *

[132] THE COURT: Proceed.

Q (By Mr. John Varda) Mr. Kassel, would you name every safety reason—and by "reason" I mean non-speculative factual reasons why Iowa should permit 60-foot twins and at the same time exclude 65-foot twins?

A Every reason—safety reason? I'm not sure I know every safety reason. One of the concerns, of course, was the longer length, the longer passing time, the longer turning—the longer time in turning at the intersection with the increased length, the longer time to clear an intersection. That's the chief characteristic difference between 65 and 60's.

Q Would you name every safety reason why Iowa should permit—should exclude 65-foot twins as compared to 55-foot semis?

A 65-foot—exclude 65-foot twins?

Q In a comparison with 55-foot semis.

A Now, you've really got me. 65-foot twins should be excluded as related to why 55-foot semis are permitted? Do you want to rephrase the question?

Q Let me try again. Will you name every safety reason why Iown should exclude 65-foot twins and use as your comparative base, if you need one, 55-foot semis?

A Well, I think just the items I stated in the previous question relate to those.

Q There would be no difference?

[133] A The difference between the 60 and 65-foot.

Q Would you name every safety reason—and, again, I mean a non-speculative factual reason—why Iowa should permit 65-foot auto carriers and at the same time exclude 65-foot twins?

A The auto carriers are 60 foot with an overhang provision.

Q What difference does that make to the overall vehicle length?

A Well, it affects—the turning radius is somewhat different, depending on where your axles are located, whether you are on the tailend of the trailer unit or whether you are with an overhang.

Q Do you know which has a greater turning radius; a 65-foot twin or a 60-foot auto carrier?

A 60-foot auto carrier has a greater turning radius.

Q So the turning radius of the auto carrier is larger than the vehicle you exclude?

A That's right.

Q So that wouldn't be a good reason, would it? A smaller turning radius is generally more desirable, is it not?

A I was just raising the question to clarify we were talking about the 60-foot auto carriers; not 65-foot auto carriers.

Q Could we go back to the—

[134] A That's all I was doing with that remark.

Q Can we go back to the original question? Will you name every safety reason why Iowa should permit 65-foot—Excuse me. Strike that.

Can you name and will you name every safety reason why Iowa should permit 60-foot auto carriers at a total length of 65 feet with overhang and at the same time exclude 65-foot twins?

A I can think of no safety reason related to that variation in the Code.

Q Will you name every reason—and, again, every non-speculative factual reason—why it is beneficial to the national transportation system and to the nation as a whole for Iowa to exclude 65-foot twins?

THE COURT: Would you read that question again, Miss Reporter?

(Question read by the reporter.)

MR. BITTNER: I will object. It calls for an opinion and conclusion of the witness based on speculation to which there has been no proper foundation laid.

THE COURT: You may answer, subject to the objection.

THE WITNESS: I think it relates to the uniformity we have with the states to the East to exclude the 65-foot double bottoms.

Q (By Mr. John Varda) You mean Illinois, Indiana, Ohio?

[135] A Their systems.

Q Is it your understanding that the states immediately to the East exclude 65-foot twin trailers?

A Yes. They are allowed on selected parts of their system, and not on their general highway system.

Q Okay. Can you explain why that is beneficial, in your view?

A I would like to refer to the previous discussion we had here regarding uniformity, and in an effort to keep uniformity, go with the more minimum standards of the states. The state that has the most minimum standard is easier to get uniformity on than the one with the most maximum. We are not interested in 105-foot twin bottom loaders. Those are strictly in the West.

Q Is that your understanding of promotion of highway uniformity in highway transportation consistent with economic needs of the state and the nation?

A Uniformity has a great economic value. I think I got that from the comments you made.

Q Will you name every reason, meaning non-speculative factual reason, why it is beneficial for the national transportation system and to the nation as a whole for Iowa to exclude 65-foot twin trailers from interstate highways in the State of Iowa?

A Why it is beneficial to the nation as a whole to [136] exclude 65-foot twin trailers from the interstate? I really don't feel qualified to answer that question.

Q Isn't that part of the subject of the 1975 study?

A The study discussed 65-foot twin trailers on Iowa highways.

Q Did the study show benefits to the transportation system from Iowa's authorizing 65-foot vehicles in Iowa?

A To selected parts of the national system.

Q Did it show any non-benefits to the national system from permitting 65-foot twin trailers in Iowa?

A No.

Q It showed a net decrease in road wear to highways everywhere as a result of authorizing 65-foot twin trailers in Iowa?

A Yes.

Q There would, in fact, be a net decrease in road wear as a result of authorizing 65-foot twins in Iowa?

A On the national scene, yes.

Q There would, in fact, be a net gain in revenues to the State of Iowa as opposed to road wear costs as a result of the added vehicles operating through Iowa in the event Iowa authorized 65-foot twin trailers?

A Yes.

Q There would be a national fuel savings of some 7 million gallons annually as a result of Iowa's authorizing 65-foot [137] twin trailers?

A Yes.

Q It is true, is it not, that reduced shipping costs which would result from using 65-foot twin trailers on cube-restrained loads would result?

A Could I answer that with a qualification?

Q Sure.

A It would be a yes with the understanding that the —that there may not be a direct dollar savings to the shipper, per se, by that operation, but that the rate of increase as increased operating costs go up should be less rapid than without them.

Q Is it not true that the savings from the reduced costs would be passed on to shippers?

A I'm not sure how quickly they would be passed on or in what form they would be passed on. Obviously, there would be a reduced cost to the trucking industry themselves immediately.

Q In your testimony in Motor Club of Iowa v. Department of Transportation, equity No. 56948, April 29, 1976, at Page 70, you were asked, "And that"— operation of 65-foot twins—"would result in savings to the shipper and the consumer?"

Your response was: "Yes, I would think that the results would pass down. Any time you reduce the cost of shipping, you reduce the cost of the product, and the competitive economy requires that you try to price it as cheap as you can."

[138] A I have learned a little bit since that answer on the competitive nature of the industry.

Q Where did you acquire this education?

A In further experience in rate discussions as regards regulation and de-regulation of the various transportation segments in our country.

* * * *

[139] Q So as far as you are concerned, as far as you can tell, the accident experience with 60-foot twins in Iowa as presently authorized is approximately the same as you experienced with 55-foot semis?

A In fact, we find the accident rate has been running less on the 60-foot units than on the semi units.

Q Has that been an experience over a number of years now?

A Yes. We have noticed this as we see fewer twins operating in the State, the accident rate still seems low, and it became an unusual occurrence to have an accident with a twin unit, and we try to investigate each of those few that we have to see what was the cause.

Q So even paying particular attention to the accident rates and the accidents of the 60-foot twins, you have noted no problem with them? They are a safe vehicle?

A They are operated safely in this state.

* * * *

[141] Q Now, I ask you again, sir, would the addition of one 65-foot vehicle to the traffic stream on I-80 every ten miles change its level of service or even approach

changing the level of service on any segment of the highway?

A My answer has to be yes, it could.

* * * *

[143] Q Is he [Jack Leisch] a recognized authority in the field of level of service analysis?

A He is an authority.

* * * *

[144] Q It is your position that any added vehicle to Interstate 80 would affect its level of service?

A On selected segments, on selected areas.

* * * *

[145] Q Just so we keep in step here with your testimony, on April 29 of 1976 at Page 63 you were asked if the increase in number of trucks to 163 a day on Interstate 80 "would be relatively insignificant, would it not?" Your answer was, "Yes."

A It was yes at that time.

* * * *

[151] Q Now, if I direct your attention to the first section of Exhibit 3 at Page 5, stating the purpose and intent of the recommended policy, is it not to promote safety of highway transportation?

A Yes.

Q And to promote efficiency and economy in both intrastate and interstate operation of motor vehicles?

A Yes.

* * * *

[152] Q And does the State of Iowa authorize operations of trailers in excess of 40 feet in the 55-foot combination?

A Yes.

Q That's inconsistent with the AASHTO recommended standard?

A Yes.

[153] Q Does Iowa authorize the operation of certain 60-foot semi trailers for transportation of livestock and other commodities?

A Yes.

Q And would those vehicles be in excess of the AASHTO standard both with respect to the length of the overall length of the unit and the trailer unit?

A Yes.

Q What is the recommended standard length of twin trailer units in the AASHTO standards?

A 65.

* * * *

Q Is it a correct statement that allowing 65-foot twins in Iowa will not result in diversions of commodities or traffic from rail?

A Yes.

* * * *

[157] Q What action was taken by the Commission with respect to 65-foot twin trailers after the report was submitted?

A The Commission took a vote on the report, or on the question of 65-foot twin trailers. As I remember the vote, it was four to three in favor of 65-foot twin trailers with recommendations going with that that the Legislature [158] consider the ban of studded tires and implementation of functional classification.

* * * *

[160] Q (By Mr. John Varda) Can you indicate which issue or issues were on the minus side?

A Well, the safety issue was one that we had a hard time identifying where it fell. That was inconclusive.

Q The only thing that we have got from you on that subject takes us back to longer length, the passing, the intersections and the ability to clear the intersections. We have come back to the same point, I take it.

A Yes.

Q You would agree with Mr. Nimmo that the study in Exhibit 2 and Exhibit 1 was an exhaustive study of the subject?

A Yes.

Q Can you be more specific as to what areas with regard to safety you consider the study to have been inconclusive in?

A We had a real problem with the accident rate with the twin trailers and the severity of the accident with the twin trailer.

Q Where is that reflected in your report?

A Maybe it is not in the report. It is just in the general knowledge of putting the report together. We obviously don't put everything in the report that we run across in the study, the feelings or concerns that we have.

Q So is it your professional opinion that this report is inconclusive on the subject of safety?

A Yes.

[161] Q Why wasn't that opinion included in the report?

A I would say that those issues came up in the question period with the Commission, and we didn't answer them. The Commission felt uncomfortable with the study on safety.

Q With respect to the accident rates and accident severity, would measures of fatality relate to the subject of severity as you have raised it?

A It would be one measure of severity.

Q Is it your position that the report is totally inconclusive with respect to accident rates and fatalities?

A I guess I wouldn't say inconclusive. I would say it is not conclusive.

Q What do you mean by conclusive?

A Where it clearly shows that they are unsafe or that they are safer.

Q Is there any statistical information anywhere in the report that indicates twin trailers to be unsafe?

A No.

Q Are there not reliable comparisons of twins and semis which demonstrate twins and semis have a lower accident rate?

A Twins and semis have a lower accident rate than what?

Q Excuse me. Twins have a lower accident rate than semis.

A Yes.

Q How then is the data gathered inconclusive?

[162] A We recognize that the sample that we had to show those rates are very small.

Q Now, may I direct your attention to Page 4 of the Exhibit 2? Does it not state that, "However, the fatality rates and the accident comparisons between doubles and tractors semi-trailers from this table"—referring to Table 4-6—"should be quite reliable in that they are based on several years and extensive vehicle miles of travel"? This table shows doubles possessing lower accident and fatality rates than tractor-semi combinations for all years compared.

A Yes. This is information that was collected from trucking firms. We didn't find the same correlation of data collected from the public safety agencies in the various states.

Q Wasn't the same thing true from the reports of the Bureau of Motor Carrier Safety?

A What was true?

Q The statement that I just read.

A The Bureau of Motor Carrier Safety—we were very confused by the reports they put out because it seemed to have changed as the report developed. We received conflicting views from them.

Q If you will look at Table 4-6, you will find that the report, which the study indicates should be quite reliable —isn't that the Bureau of Motor Carrier Safety report, is it not, in the comparison of doubles and semis?

[163] A It still was reported from the trucking companies, was it not, to the Bureau of Motor Carrier Safety?

Q Yes, sir. Your study found that report to be reliable, did it not?

A We stated as such.

Q The California study, which was reviewed in the report, was regarded as coming to approximately the same conclusions, was it not?

A Yes.

Q That information was collected by the California Highway Patrol, was it not?

A Yes.

Q The study done by the Iowa DOT of 15 trucking firms came to a similar conclusion, did it not?

A Yes.

Q The statements of the various states, with very limited qualification, provided, in response to the questionnaires, are consistent with the observations and statistical data, are they not?

A To some extent yes.

Q With very limited qualification, is there not? By and large those statements are absolutely consistent with the data that you developed for the report?

A Yes.

Q What does it take to be conclusive, sir?

[164] A I think it takes a larger sample than what we did have there. I think it—

Q I don't understand that, sir, when the very reason that you point out for the reliability of the sample is that it is a large sample. Can you explain that?

A It is not large in relationship to the total traffic stream we have out there. It is a very small percentage of the accidents that take place in our highway system. We have much more data on the automobile accident than we do on the truck situation. Accidents, as you are well aware, are kind of unique circumstances. They are different than the normal stream of traffic, and it takes a lot of information to make sure that uniqueness.

Q Do you realize that the study you are referring to on Page 4-6 includes almost 3.5 billion miles of operation?

A That's a very small amountage of operation totally in our system on a yearly basis.

Q Do you realize that that represents almost 10 percent of all the miles operated annually by Class 1 and Class 2 common motor carriers of general commodities?

A I didn't realize that it represented 10 percent.

* * * *

[168] Q Do you have a professional opinion as to whether there is a valid safety reason for Iowa to permit 60-foot twins but to exclude 65-foot twins?

A Do I have a professional opinion?

Q Yes, sir. I am just asking you if you have an opinion.

[169] A I don't know whether I have an opinion or not. I have to search my mind, I guess. I haven't really addressed myself to that question.

* * * *

[172] Q Mr. Kassel, if we may resume from yesterday, would you direct your attention to Page 26 of Exhibit—excuse me—Page 25 of Exhibit 2? You note there the figures 20 million vehicle miles, 296 accident involvements and two fatalities?

A Yes.

Q Is that the estimates for operations of 65-foot twin trailers through the State of Iowa?

A Yes.

Q When we go down below, we have 6.5 million miles, 96 accident involvements and 0.6 fatality involvements. Do those figures relate to the added distances traveled around the State of Iowa?

[173] A Yes.

Q Now, to get the total miles, accidents and fatalities for operations around the State of Iowa, it would be appropriate to add those figures which I have just given you, would it not?

A Yes.

* * * *

[176] Q (By Mr. John Varda) Did you reach conclusions? Let me clarify the meaning of "conclusions" as something more than a discussion.

A We presented the facts in each of those issues. We didn't state in the report at all fact basis or conclusions. We stated fact and basis and characteristics.

Q In your testimony on April 29 of 1976, [in another case] you were asked the following question: "Concerning braking, passing, maneuverability, spray and the other factors you just mentioned, did you find any difference in the performance characteristics between 65-foot double bottoms and the conventional semi trailer or the 60-foot twin?"

Do you recollect what your answer would have been to that question?

A I don't recall the answer.

Q Your answer was: "Yes, we did."

Now, would you recall the next question?

A No.

Q It would be pretty difficult to recall, so I will give it to you. The next question was: "What were those conclusions?"

Do you recall your answer to that question?

A No.

Q Your answer was: "Do you want me to go through them all?"

The next question was: "No; just in a general manner. [177] Were 65-foot double bottoms safer; did they perform better; did they perform worse?"

Do you recall you answer to that question?

A No.

* * * *

[178] Q (By Mr. John Varda) Your answer to the last question was as follows: "The turning radius of a 65-foot double combination is much better than the regular semi; that is, they maneuver much better in that aspect. The passing characteristics—we find that the break in the crosswinds caused by the separation of the trailers make them easier to pass in this respect than a regular semi, but you get less wind blast at a traveling motorist. Spray is dependent more on the configuration of the body than necessarily the truck unit itself. There is a difference in the stopping distance of the unit also."

That response was a report of all of the favorable conclusions that you reached in your report, was it not?

A It is a statement of the facts that we reached, yes, as stated in the characteristics, as illustrated by Page 25 of Exhibit 2.

Q Sir, were these not expressed as conclusions?

A They were expressed as conclusions or statements of fact.

Q So they were expressed either as conclusions or statements of fact?

A Yes.

Q And the following statement from Page 26, sir, is a conclusion, is it not?

"The analysis of braking performance, passing distance, maneuverability, splash and spray characteristics and aerodynamic [179] disturbance characteristics yield no areas requiring sacrifice to safety."

That, sir, is a conclusion, is it not?

* * * *

THE WITNESS: Yes.

A (By Mr. John Varda) It is a conclusive statement?

A Yes, on those characteristics.

* * * *

[182] Q (By Mr. John Varda) You indicated in your answer that they [other state] did not report a growing problem. [after legalizing twins] The following question was asked: "Sir, would 65-foot twin trailers increase the rate, the accident rate, if they would be legalized here in Iowa?"

Do you recall you answer to that?

A My answer probably was that I did not think they would increase the accident rate.

Q The answer was, "Not based on the evidence of the states that permit them."

The question following that was, "They would, or would not?"

Do you recall how you responded to that question?

A No.

Q The answer was "Would not."

Do you understand what the answer "would not" meant?

A Yes.

Q Would not increase the accident rate?

. A The accident rate.

Q Can you indicate why you think or thought they would not increase the accident rate?

A At that time?

Q Yes, sir.

A The reason that would not was because the vehicles that were in the traffic stream then, the larger vehicles [183] and the acceleration they had would not have a significant increase in time of exposure to the vehicle.

Q Do you recall at what time you made reference to?

A 1975.

Q Do you recall when this testimony was given?

A 1976.

* * * *

[187] Q What reasons do you have to believe there is any significance to those observations?

A Well, I suppose just the fact that if it [the twin trailer] is five feet longer, it takes that much longer to clear the intersection, and maybe it is because I tangled with a truck recently waiting for him to clear.

Q At 10 miles an hour, how much longer would it take that extra five feet to clear an intersection?

A A fraction of a second.

Q If it would be a third of a second, would that be a proper estimate?

A Probably.

Q A third of a second is about as long as it takes for me to say the word "go", is it not?

A Probably.

* * * *

[189] Q Do you know of any other source, besides the potential testimony of Professor Karstens, for practical non-speculative evidence on the subject of turning at intersections and clearing of intersections?

A Probably at Nevada, Iowa, at Lincoln Way and Sixth Avenue. I go through that at least once a day and think about the trucks trying to maneuver through there and cross that intersection, and listen to my wife comment on it.

Q Isn't it harder for a 55-foot semi to maneuver than it is for a 60-foot twin trailer?

A Correct.

Q Isn't it harder for a 55-foot semi to maneuver in that situation than a 65-foot twin trailer?

A Yes.

* * * *

[191] Q (By Mr. John Varda) The State of Iowa permits the operation of 65-foot twin trailers in border cities, does it not?

A Yes.

Q Do those border cities have many street intersections at grade?

A Yes.

Q Does turning radius affect the time of turning at an intersection?

A Yes.

Q A smaller turning radius takes less time?

A Yes.

Q 55-foot twin trailers have a larger turning radius than 60-foot twin trailers?

A Yes.

Q And they have a larger turning radius than 65-foot twin trailers?

A Yes.

Q I may have misspoke myself. When I referred to 55-foot vehicles, in your answer did you understand that to be a 55-foot semi?

A Yes, I assumed that.

Q Do you know whether the difference in turning radius between a 65-foot twin and a 55-foot semi would make more of a difference in the time to turn through an intersection than would the added 10 feet of length of the 65-foot twin trailer?

* * * *

[192] A Okay. It would take longer for a 55-foot semi, under some conditions, to turn than it would for the 10 feet to clear.

Q On the movements straight through an intersection, sir, would acceleration of the respective vehicles affect the time for a 55-foot semi or a 65-foot twin to clear an intersection?

A Yes.

Q Do you know which vehicle accelerates faster?

A No.

* * * *

[193] Q Has the Motor Club of Iowa consistently opposed 65-foot twin trailer in Iowa under all circumstances?

A I couldn't answer whether the Triple A has been at all times.

Q You were present at the hearing on November 27, 1974?

A Yes, I think I was.

Q Is that an occasion on which the Triple A indicated that it would not oppose 65-foot twin trailers in Iowa under certain conditions?

A Yes.

Q And what were those conditions?

A This was related to paying their costs and changing [194] the whole cost structure, I guess.

Q In other words, the Motor Club of Iowa would not oppose 65-foot twin trailers if they paid their fair share, in the view of the Motor Club?

A Yes, cost responsibility, financial responsibility for the highway.

Q Did you consider that position to be an official position of the Motor Club of Iowa?

A Yes.

Q Would you consider that position, from your standpoint as a public official, to reflect on the credibility of safety concerns expressed by the Motor Club of Iowa concerning the operation of 65-foot twin trailers?

A Yes.

* * * *

[196] Q Is it true that, in general, commodity operation of 60-foot twin trailers in use in Iowa cannot be interchanged with other carriers?

A It is my understanding the equipment is not standardized any longer.

Q And does that make it difficult or impossible to [197] interchange the equipment?

A I would say it makes it difficult.

Q What do you mean by your answer that "the equipment is not standardized", in general?

A Well, it is my understanding that when we legalized 60-foot double bottoms, that these were then the standardized units; and subsequently they have increased in size to the 65-foot units.

Q So, if I can get this straight, the 60-foot twin is no longer a standard unit?

A Of the industry.

Q The 65-foot unit is the standard unit?

A Of industry.

Q And because the 60-foot unit is not standard, it is difficult to interchange that unit with other carriers operating the standard units?

A That's my understanding.

Q Are the units used in 60-foot twin combinations, the shorter trailer units, custom built for service in Iowa?

A The new ones would have to be custom built since it is not an industry standard.

* * * *

[198] CROSS EXAMINATION

BY MR. GOODWIN:

Q Mr. Kassel, as I understand, you have been Director of the Iowa Department of Transportation for the past 14 months?

A Yes.

Q Now, prior to that time, what positions did you hold?

A For approximately one year I was the Deputy Director of the Department.

Q And then before that, what position?

A I was Director of Planning and Research.

Q Now, the 1975 report that has been referred to as Exhibits 1 or 2, you were the Director of the Planning Division at that time?

A Yes.

* * * *

[200] Q Is congestion of traffic a safety factor?

A The greater the congestion, the more accidents you will have.

Q Now, if you have more trucks within that traffic congestion, will you anticipate more accidents involving trucks?

A Yes.

* * * *

[201] Q Would you anticipate that the fatality rate in accidents with trucks would have been greater with smaller cars?

A Yes.

Q Then on top of that, if you would make the trucks even bigger, say from 60 feet to 65 feet, would you anticipate that fatality rate to increase even more?

A The greater the discrepancy in size between the vehicles, the greater the severity of the accident to the small vehicle.

MR. LEDERER: May I have clarified when you say "fatality rate", are you talking about fatality rate per mile or fatality rate per accident?

Q (By Mr. Goodwin) Do you want to refer to the report?

A I interpret your question as fatality rate per accident.

Q I believe you indicated in your direct testimony that you anticipated allowing 65-foot twin trailers in Iowa would increase the amount of traffic, and it would increase the amount of accidents.

[202] A Yes.

* * * *

Q Are you aware of whether or not there has been continued pressure upon the part of the trucking industry to have the states allow bigger trucks?

A Yes.

Q They have been doing that?

A Yes.

Q Has there been pressure on the part of certain members of the trucking industry to allow states to have larger twin trailers?

A Yes.

Q They have been doing that?

A Yes.

Q Has there been pressure on the part of certain members of the trucking industry to allow states to have larger twin trailers?

A Yes.

Q Are there some states that allow even triple trailers?

[203] A Yes. There are some of those states that have 105-foot units operating.

Q Now, by triple trailers we are talking about a tractor and then three trailers?

A That's correct.

* * * *

Q Now, even if a state were to allow 65-foot twin trailer units, would you anticipate that there could still be pressure by the trucking industry to have the states allow even larger doubles or yet triple trailers?

A The whole history of the trucking industry is to keep increasing the size of the allowable vehicle.

Q Yesterday you were asked about the uniformity of regulations on truck size within the United States among the various states. Are you aware of whether the states —various states have determined varying truck size limitations?

A The states have varied truck sizes within their boundaries.

* * * *

[205] * * * Yes, there are 27 states allowing in excess of 60-foot, with various restrictions.

Q Are you able to confirm * * * that * * * it indicates one state allows a maximum length of 85 feet?

A Yes.

Q Which state is that?

A Wyoming.

Q Is there a state that allows an 80-foot limitation?

A Yes.

Q What state is that?

A South Dakota.

Q Are there three states that allow 75-foot limitations?

A Yes.

Q Could you name those for us?

A Idaho, Nevada, Oregon.

Q Is there one state that allows a 70-foot unit?

[206] A Yes.

Q What is that state?

A Alaska.

* * * *

Q Would the result of having to be uniform to another state's legislative decision tend to force all the states to comply with the states, say, allowing the largest trucks?

A It could.

Q However, on the other hand, if the uniformity were to be towards the smaller units, then all the other states would be required to respond to a legislative decision in the state allowing the smallest vehicle?

A It could.

* * * *

[231] REDIRECT EXAMINATION

BY MR. JOHN VARDA:

* * * *

Q Overall, there would be fewer miles of operation, fewer accidents and fewer fatalities?

A Yes, on the national scene.

Q Does it not concern the Iowa Department of Transportation that banning 65-foot twins causes more accidents, more injuries and more fatalities?

A Do you mean outside of our state border?

Q Overall.

A Our primary concern is the citizens of Iowa and our own highway system we operate in this state.

Q Isn't it a concern to you, personally?

A Well, that comes back to we try to increase overall the safety of the system. There are various means of doing that, and various approaches to doing that situation. Obviously, our first concern is the State of Iowa, and we are very strongly working in those areas. That's why we have intensive safety programs, and that's why we offer our safety programs to other states, and exchange safety ideas with those states that have [232] success in their safety programs.

* * * *

[237] Q Well, isn't it true that twins in general commodity operations cube out well before they reach the allowable weight limits?

A They tend to cube out. I am not sure I would use "well before they reach the weight limits".

Q Isn't it true that in general commodity operations [238] the weight of the vehicles, whether it be a semi or it be a twin, are substantially below the authorized weight limit of 73,280 pounds?

A I think the weight studies may have shown that they tend to weigh out around 60,000 pounds gross Our weight limit is at 72,000.

* * * *

[253] Q Now, your testimony here was not intended to dispute the statement admitted in the pre-trial briefs

that 31 states and the turnpike authorities of New York and Massachusetts permit use of 65-foot twin trailers?

A No.

* * * *

[254] Q Yes, sir. Do you believe triple trailers are a standard for transportation of general commodities?

A No.

Q Now, that is despite the fact that they are permitted in some states?

A That's right.

* * * *

[255] (By Mr. John Varda) Sir, could you look at—just refresh your recollection by looking at Page 139? There are a series of questions there, but I particularly refer you to the question as follows:

"So even paying particular attention to the accident rates and the accidents of 60-foot twins, you have noted no problem with them. They are a safe vehicle?"

Answer, "They are operated safely in this state."

Now, sir, with respect to your testimony this morning, you made reference to certain independent studies related to 65-foot twin trailers and the conclusiveness of your report and the data that you reviewed. Can you indicate what type of independent test data you relied upon to come to the conclusion with respect to 60-foot twin trailers reflected on Page 139 of the transcript?

A I didn't even follow the question, John. You lost me completely.

MR. JOHN VARDA: Could I have that read back?

(Question read by reporter.)

[256] A Frankly, I don't understand the question. It is absolutely—It seems to be going in circles to me.

MR. JOHN VARDA: Well, I understand the question, and I think we will leave it there. That's all the questions I have.

* * * *

[300] MICHAEL GUNN,

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LEDERER:

Q What is your name, please, sir?
A Michael Gunn.

* * * *

Q How are you currently employed?
A I am employed by Consolidated Freightways.
Q What is your position with Consolidated Freightways?
[301] A I am a systems and programming data processing supervisor.

* * * *

Q Does CF, Consolidated Freightways, routinely maintain accident records?
A Yes, they do.
Q Are these accident records reported to its data processing department?
A Yes, for entry into the computer.

* * * *

[313] Q Mr. Gunn, I turn your attention to what has been [314] marked as Plaintiff's Exhibit 15. Can you identify what this exhibit is?
A Matched pair analysis description and results of summary. This represents simply a random sample of semi and double trips for selected point-to-point origin-destination terminals during the year 1978 so that there is an equal number of semi and double trips for each terminal paired month combination, and the road accidents associated with these selected trips.

* * * *

[320] Q In point states other than those identified at the top of this page between the terminal pairs in the CF system, do twins and semis travel over the same routes?

A To the best of my knowledge, that's correct.

Q Having excluded those trips that occurred in the states that prohibit twins or require twins to travel on different routes than semis and having excluded any terminal pair that had less than five semi or twin trips in any given month, what [321] did you then do?

A Well, we were left with the remaining number of semi and double trips for a specific terminal pair. Let me answer your question by giving you an example.

If we have a given terminal pair that was not excluded because of one of these aforementioned reasons, and we had 150 double trips and 50 semi trips, we randomly eliminated 100 double trips, the difference between the two accumulators, so that in further examination we would only have 50 double and 50 semi trips, the identical number for that particular terminal pair.

* * * *

Q This 188,296 trips, does that represent the sum of all the terminal pairs that had a balance number after random elimination, twins and semis, traveling over the same routes in 1978?

A That's correct.

* * * *

[322] A If you will refer to the extraction of the last page of Report 2-A, it is 56,100,018 semi, and a like number of double miles.

Q If we were to assume for a moment that the 56 million semi miles included 20 milllion miles on interstate, would the same thing be true of the 56 million miles in this report?

A Since they were traveling over the same routes, yes, that would be.

Q I realize, of course, you have said you have randomly eliminated, but putting aside chance variations, if in this report there were contained trips between Minnesota and South Dakota for the month of February 1978, between Minneapolis and—I can't think of a town in South Dakota, but let's say between Minneapolis and Fargo, North Dakota.

A Neither can I.

Q Let's say between Minneapolis and Fargo, North Dakota during the given month of February of 1978, and a blizzard occurred in the first five days of the month, would there be an equal chance of the same number of semi and the same number of double trips being affected by that blizzard?

A That's correct, based on a random elimination.

* * * *

[323] Q * * * [A]fter you achieved this matched set of semi and twin trips, what did you then do?

A We then compared road accidents that occurred in 1978 [324] to this matched or balanced trip file; based upon certain parameters, is what we compared upon.

Q What was the purpose of that? You say you matched it?

A The purpose was to ascertain the accidents that were associated with these balanced number of trips.

Q So the fatal accidents, injuries and semi and double accidents, the numbers reported in those columns are the numbers of accidents associated with these trips?

A That's correct.

* * * *

[330] Q (By Mr. Lederer) How, basically, did you determine the average driver age for semi trips and twin trips in the CF system?

A Well, as I stated earlier, we maintain the number of trips for each specific month, so it was a matter of calculating the employee's age during the particular month that [331] he drove, and then summarizing all the employees' ages for the—all the doubles and the semi trips divided by the number of doubles and semi trips to actually calculate the employee age per trip.

* * * *

[336] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[337] Q Who suggested the matched pair analysis be done?

A It was suggested by counsel.

Q And do you know if that request was generated from Mr. Glennon?

A I do not.

* * * *

[376] REDIRECT EXAMINATION

BY MR. LEDERER:

Q Mr. Gunn, have you at any time in preparing any of these reports attempted to manipulate the data or in any form structure the data so as to make twins look better than semis?

A I have not.

Q Mr. Gunn, Mr. Paff, at the end of his cross examination, suggested that you had thrown out 80-some odd percent of the trip data, or 80-some odd percent of the accident data, fatalities, and so forth. Do the 188,000 trips presented in this report for semis and for doubles represent every trip in the CF system in 1978 where there were at least five semi trips and at least five twin trips between each terminal pair during a month, and where the number has been randomly balanced with [377] the number of semi and double trips so that you have an equal number of trips?

* * * *

A Yes, * * *

[385] JOHN GLENNON

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LEDERER:

Q What is your name, please, sir?
A John Glennon.

* * * *

[386] Q Can you state briefly what types of courses or what type of education you had in the various fields of civil engineering?

A Really, a very broad training, but in the graduate work, specifically it was concentrated in the area of transportation, highway design, highway safety, traffic operations, these kinds of things.

* * * *

[390] Q Can you broadly describe the field or area of highway safety analysis?

A I guess more so I can describe it from my perspective. There are a lot of perspectives on highway safety. Very often, for example, in the research project, you get involved with trying to answer a specific problem that is noticed on the highway, and so very often rather than—as a highway safety analyst or researcher, rather than being able to operate in a pure science fashion; for example, being able to conduct [391] laboratory experiments is not possible, so very frequently or almost always you are required to deal with real world situations. The ability to do good highway safety research depends very much on the ability to control the many factors that operate on our highway system.

Q Is an accident commonly attributable to a single factor?

A Not very frequently, no.

Q Why is it difficult to do laboratory experiments in the field of highway safety?

A Well, because they really don't— It is very difficult to simulate the real world situation in which you have so many factors operating.

* * * *

[394] Q Can anyone use statistics to draw conclusions in the field of highway safety?

A I guess, yes, people do that. To make valid conclusions, it is my opinion that you better darned well know what you are talking about, know about what is involved in the phenomena of accidents, what are the factors involved. It is very easy to look at raw statistics and make a conclusion, irregardless of what went into developing those statistics, if you don't understand what went into developing those statistics.

* * * *

[395] Q Can you explain briefly what sorts of factors are normally involved in an accident?

* * * *

[396] A Page No. 1, yes. This actually lists some categories of factors that are involved in accidents, and they are, I am sure, of no surprise to anybody; driver factors, roadway factors, traffic factors, environmental factors like weather and light, and then factors of the vehicle. These are, as I said, just categories of factors.

If you look at driver factors, for example, you have things like age and experience, psychological makeup, motor skill, whether or not the driver's temporal emotional state has been disturbed, whether he has been drinking, involved with drugs, a whole slew of things.

When you get into the roadway, then you start talking about highway curvature, grades on the highway, what are the lane widths, the shoulder widths, a number of factors there that influence accidents.

Traffic factors are things like speed, traffic volume, traffic composition—which is the percent of trucks in the traffic stream—whether or not there is exposure to pedestrians, things like this.

Weather and light particularly influence accidents from two standopints; one being the driver's visibility of the roadway scene, and also on the slipperiness of the roadway.

Then vehicle factors get into weight, horsepower ratio, [397] aerodynamics, the condition of the vehicle, whether it is well maintained, has bald tires, what have you.

* * * *

Q Dr. Glennon, do you have a professional conclusion as to the safety and operation of 65-foot twin trailers compared to 55-foot semitrailers?

A Yes, I do.

Q What is that conclusion?

A After some extensive study of that comparison, my conclusion is that there is no difference in the safety between 55-foot semi combinations and 65-foot twin combinations.

Q Can you describe how you approached that conclusion?

A Yes. I went through what in the business I guess would be called a systematic or multi-stage analysis; the first stage being an interrogative look at past research dealing with [398] this problem. From there I went to—and these were general studies—what is the gross difference in accidents between semis and twins.

From there, given that those gross or general studies may have potential biases involved in their comparisons, I took a very detailed look at the 1978 Consolidated Freightways accident records in terms of various descriptions of the accidents, classifications of the accidents.

Then the third stage was what we have referred to as the matched pair analysis, in which seemingly we would be able to control for all biases in a comparison between the two vehicle types.

I did one other analysis too, and that involved looking at the burden of the Iowa ban on the total accident experience.

[399] Q (By Mr. Lederer) Would your conclusion rest on any single statistical study or any single piece of information?

A No, not at all. It is based on the—what you might say is a synthesis of all this three-stage or four-stage level of analysis.

Q Do you have a high level of confidence in that conclusion?

A I feel very comfortable with it, yes.

* * * *

[400] Q Before we go any further, can I turn your attention—Let me ask you what do you mean when you say "statistically significant"?

A Very commonly in statistical tests a significance level, particularly in highway safety analysis, a 95 percent significance level will be used in testing the difference between two samples of data. What that means is that if you, in fact, say—when you've done a statistical test, and you say that "This difference is significant at the 95 percent level", what that says is your chances of saying that is significant when it really is not truly a difference between the two samples is five percent. In other words, your probability of having made an error in saying there was a difference when, in fact, there wasn't is one in 20.

Q When you say "in fact, there wasn't", do you mean by that the difference might be the result of random chance rather than—

A Yes, that's correct.

* * * *

[402] Q I'm sorry. I have perhaps turned your attention away. Turning back to Page No. 3, you described

the summary of those reports. Can you describe for each report what the advantages and disadvantages or the relative reliability of the reports are?

A Yes. Do you want to take them one by one?

Q Please.

A Looking first at the California Highway Patrol study, it is very difficult to tell what they did. You read the report, and you re-read it, and you read it for the fourth time, and it is not very clear what they did. It is clear that they did make one assumption which is questionable, in my mind. They did compare semis with twins. That was the basic [403] intent of the study. They did have accident data classified by semis and twins. The problem comes in in trying to decide what the exposure of those two types of vehicles were in California.

Q What do you mean by "exposure"?

A How many miles were driven by each category of vehicle. They went through apparently many machinations in trying to come up with those numbers. Various assumptions were made. One in particular is that semis and twins have equal average trip lengths. I forget what the numbers are, but say the average trip length of a semi was 400 miles, and the average trip of a twin would also be assumed to be 400 miles. These are not measured numbers. These are assumed numbers.

Q So you would regard that study as having relatively low reliability?

A Yes. I wouldn't place a lot of faith in the results of that particular study.

Q Did that study necessarily compare 55-foot semis and 65-foot twins?

A Not necessarily, no.

Q Can you dismiss the Bio Technology study?

A The Bio Technology study was a study much like the California Highway Patrol in that it depended on existing sources of data in order to compile accident rates for the [404] two different vehicle types. In this case, they had accident data from the California Highway Patrol. One thing I didn't mention on that previous study was that those accident data were injury and fatalities only; not property damage only accidents. That was not in the data base of either one of the studies.

Bio Technology was forced to make some assumptions to generate an estimate of the total number of accidents involved in this study from just those two sources. When it came to again looking at the exposure of these vehicle types, they opted—and, as I understand it, they were under a lot of pressure to produce this document in a very short time—they opted to use the same assumptions that the California Highway Patrol report used; that both vehicle types had the same average trip length per vehicle. With that assumption and with some data that —some state-wide data on the total number of vehicle miles by trips, and also vehicle counts at counting stations by vehicle trip, they came up with an approximation of the exposure of the two different vehicle types.

Q When you say "vehicle counts at counting stations", can you explain what that is?

A Well, I don't understand it entirely, but in California they have 15 counting stations, and those counting stations count the various vehicle types as they pass through the stations.

[405] Q What source do they use for their accident data?

A California Highway Patrol.

Q And would that be accident data for all roads in California?

A The California Highway Patrol—I don't remember the exact numbers—but patrol something like on the order of 10 percent of the total mileage of roads in California. That particular mileage that they do patrol is 98 percent rural mileage.

[406] Q (By Mr. Lederer) Did the studies use counts from both rural and urban counting stations?

A Yes. There were 11 rural counting stations and four urban counting stations.

Q The accident data was not on the same base?

A No, I wouldn't say that. It was [not] a very good representation in terms of the exposure for those accidents.

Q Does that create a bias in the study?

A Yes, I think so.

Q I notice on the left-hand column you have three divisions, so to speak, of the Bio Technology study. One is uncorrected, and one is corrected, and the other is on a 10-mile basis.

A Yes.

Q I assume we have been discussing the uncorrected so far.

A So far, yes, and the results of the uncorrected study, as you see there, showed no significant difference in the accident rate or the injury rate, but found twins to be significantly higher than semis for the fatality rate. Just taking that study as it is and saying, "Is there a demonstrable bias in it?", to me there is a demonstrable bias in terms of using both rural and urban stations. Correcting for that demonstrable bias is what the corrected study refers to on this sheet. In other words, we took the vehicle counts as represented [407] entirely at the rural stations, and we reproportioned the total truck mileage according to semis and twins, based upon the proportions of those counts rather than the proportion of both rural and urban.

Q Have any other commentators criticized the Bio Tech study similarly?

A Yes. I read a letter, I believe it was from Dr. Hedlund of the National Highway Safety Administration, that had essentially the same criticism of the data.

MR. LEDERER: That letter is in the record, Your Honor.

THE COURT: It is? All right.

MR. LEDERER: It is an exhibit in Mr. Freitas' deposition.

Q (By Mr. Lederer) Before we move back to the corrected study, on the uncorrected study, was there any difference in the number of fatal accidents between the semis and the twins?

A You are talking about a statistically significant difference?

Q Yes.

A No, there wasn't, as I remember.

* * * *

[409] Q By Mr. Lederer) Can you explain what the ton-mile basis is?

A That's looking at the accident rates based on a ton of cargo moved per mile. It is a different exposure. Rather than just a mileage exposure, it is an exposure that is calculated using the weights of cargo carried by the vehicles, so it is kind of a— It is more of an efficiency measure in a certain sense in that it says, "What is the penalty for moving or for getting so much work done?"

Q But that's the penalty in terms of the number of accidents?

[410] A Yes, right.

Q Is that, in that sense, a safety comparison?

A It is a way of comparing safety, yes. And this particular case—and this is based on the uncorrected study—the twins had a significantly lower rate of accidents than semis, and what that tells you— Well, it is a lower rate and lower injury rate. What that tells you is if the study is in fact correct, that if you moved the same amount of cargo totally in twin vehicles, that the number of injuries and the number of accidents would be lower than what was experienced.

Q Generally, overall, would you give the Bio Technology the same low level of reliability that you assigned to the California Highway Patrol study?

A Essentially. It was, I think—Maybe they made a few wiser choices than the California Highway Patrol, but still it is very difficult to place a whole lot of confidence in that particular study.

Q What about the Iowa Department of Transportation study?

A The Iowa Department of Transportation study computed accident rates from data supplied by several carriers that they solicited, and as shown on this sheet, the one conclusion that they had was that twins were significantly—the twin rate was significantly lower than the semi rate; also that there was no significant difference in the fatality rate.

Q Were you able to make any kind of a detailed analysis [411] of the Iowa DOT study? Did you have reports giving fully how it was performed?

A It was not very clear what all was done in the Iowa DOT study, this particular part of it. They did say, you know, that they had solicited information, I think, both on accidents and exposure by vehicle type from the various carriers.

What is not clear to me is the reporting criteria that was used by the various carriers, and that could introduce some bias in the study. It is not clear at all what was done there.

Q Turning your attention to the United States Department of Transportation Bureau of Motor Carrier Safety study, is that the study referred to there, the study entitled "Safety Comparison of Doubles Versus Tractor Semitrailer Operation", which has been marked as Plaintiff's Exhibit 22?

A Yes, it is.

* * * *

[412] * * * [T]he BMCS study represents actual accident data and exposure data that BMCS solicited from —I forgot the number—some nine or 10 carriers for the period of 1969 to 1976.

Q What basis was used for the exposure?

A It is a vehicle mile basis, as I understand it. It is, I believe, pay miles by vehicle trip.

Q Who reported those miles, or where did they come from?

A They were reported by the carriers.

Q What was the accident criteria that was used?

A BMCS used a criteria that says, "We will include in this sample all accidents that had a fatality, a personal injury or $2,000 of property damage."

Q I note on your summary that you have given the number of miles that were available in each of these studies. Is the [413] number of miles of exposure in the study significant in regard to the study's reliability?

A It is a very large number.

Q Does that contribute or detract from the study's reliability? Is it desirable to have a large number of miles?

A It is very desirable. The more the better, in terms of exposure, yes.

Q Is it desirable to have a study for a single year or a study over a period of years?

A Probably over a period of years would be a better thing to have in most cases. It just gives you a better view of the picture.

Q Did you also look at the Consolidated Freightways' data in regard to the preparation of your testimony?

A Yes, I have.

* * * *

[416] Q What sort of tentative conclusions or opinions did you hold after reviewing these statistical studies? What was your general summary after reviewing all of them?

A Well, I think my tendency would be to sum these studies together, and say, "It looks to me like twins look [417] better than semis", but I wouldn't be willing to say that really because we talked about, like, in the Bio Tech study, there was a demonstrable bias in that study. There are other potential biases that are not directly demonstrable. For example, in any of the studies, did the two different vehicle types travel over the same portions of types of roads? Is there any systematic bias in the drivers that are assigned to the two different kinds of vehicles? Are they exposed to different traffic conditions, different weather conditions, what have you? There is no indication in any of these studies of whether or not either of these factors were controlled for or accounted for in the study.

Q Did you conduct additional research to attempt to determine whether there might be biases introduced by these factors?

A Yes, I did.

Q Can you explain what the chart on Page 4 of Exhibit 18 is—excuse me—on Page 5 of Exhibit 18?

A This is a percentile distribution of the dollar damage to Consolidated Freightways equipment in the 1978 accident data experience. What it shows is that the distribution of damage— Let me put it another way. For any given dollar value of damage that you select as a cut-off point, that if you included accidents above that particular cut-off point, that more twins would be included than semis [418] proportionately because of that particular cut-off value.

* * * *

[420] Q (By Mr. Lederer) Why would there be a higher proportion of semi accidents— Looking now just at accidents involving property damage where a dollar cut-off criteria would be applied, ignoring injuries and fatalities, why would there be a high proportion of semi

accidents excluded any time you use a dollar cut-off than twin accidents? What is causing the difference?

A Well, if you look at—which I have looked at—the original accident reports, and I have spent a considerable amount of time interrogating those original accident reports, what you find is that most of the equipment damage in these kinds of accidents is to trailing equipment. If you look at the value of the trailing equipment, which has been in testimony before in a deposition, I believe, the value of trailing equipment for the 65-foot twin combination is approximately $17,000. The value of the trailing equipment for a semi combination is approximately $10,000, so given an accident of a certain impact severity, it would appear to me that the probability of a higher dollar value—there would be a probability of a higher dollar value with the semi combination —I mean with the twin combination rather than the semi combination.

Q Simply because the trailing equipment of the vehicles [421] is more valuable?

A Right; exactly.

MR. LEDERER: That information, Your Honor, is in the prepared testimony of Mr. Wrightson as to the dollar value of CF equipment.

Q Is that analogous to the situation of using the dollar cut-off on accident reporting and comparing accidents with Volkswagens and Mercedes Benz?

A That would be a good example. If you used—let's pick a number—$500, or maybe even some higher value, what you might find is that Mercedes Benz were involved in a whole lot more accidents than Volkswagens, because you have exercised this criterion; the damage to Mercedes Benz being much higher on the normal than to Volkswagens.

* * * *

[422] Q (By Mr. Lederer) Would your analysis on Page 5 seem to indicate to you that the selection of the

$2,000 cut-off in the BMCS study would carry bias against twins?

A Yes, it would. I think probably almost any dollar cut-off would.

* * * *

Q And the BMCS study shows what in regard to injuries and fatalities for twins compared to semis in terms of is there [423] a significant difference?

A Yes. BMCS showed that the twins were significantly lower on accident rate, injury rate and fatality rates, all three of the rates of interest.

* * * *

[430] Q Turning to Exhibit 18, Page No. 11, can you explain what this page indicates and what it is that your subsequent analysis after these pages does?

A Okay. As I discussed this morning to some extent, having looked at all these general studies—and each of those [431] had a conclusion regarding the comparison of twins and semis—I felt that it is important to really scrutinize those kinds of conclusions because of the lack of describing what kind of controls were exerted in the studies themselves, and the hypothesis being that there would be potential systematic biases that might be operating in those data sets that either weren't controlled or weren't accounted for and aren't directly demonstrable. So, you start to interrogate, in a sense, those studies, and you say, "Well, when you are talking about the two different vehicle types, did they have the same kind of drivers; were they operated under the same weather and light conditions; were they operated proportionately on the same kind of roadways", and things like this that could introduce systematic biases in the data.

What this page shows is the kind of systematic biases that I evaluated, using 1978 CF data because of the ability to work with that data to examine these sorts of biases.

* * * *

[453] Q Turning your attention to Page No. 27, what was the hypothesis that you analyzed there?

A Okay. This is what I typify as the third stage of analysis; saying, "Okay. We've looked at the general studies. I've looked at the detailed analysis of the CF data, potential systematic biases that might be operating, but still I am not entirely sure of all of these comparisons because there may be some other kind of biases that are operating that I can neither identify nor account for in any way", and so I conducted two other analyses which made an attempt to account or control for other potential systematic biases.

Q What were those analyses?

A We have already talked about the matched pair analysis. [454] Then there was one additional one which compared—which is shown in here comparing the semi accident rate in those states that allow twins with the semi accident in those states which did not allow twins, the assumption being that if there is a regional bias—and I am on Page 29 right now, by the way—if there is a regional bias that favors twins, then that bias would tend to show a lower accident rate for semis in that same region than for semis in the region that didn't allow twins.

Q Let me take you back through this. I'm not quite sure it is clear, at least to me.

You are assuming that overall there is some regional bias that favors twins, it that correct?

A That is the basic hypothesis I am starting with, yes.

Q If that hypothesis were true, the states that permit twins would somehow have safer driving conditions than the states that do not permit twins?

A If that bias was favoring twins, yes.

Q And if those states were safer, what would be true about the semi rates of those states, "those states" meaning the states that permit twins?

A You would expect those rates to be lower than the rates in the states that didn't permit the twins.

Q Okay. And did you find that to be the case?

A No, I didn't. What I found from the rates that are [455] shown in the table here is that there was no significant difference except for the injury rate, which was higher for semis in the states permitting both semis and twins so, in fact, if there were in fact a regional bias, that would indicate that the bias was favoring the semis in the analysis—in the total analysis.

* * * *

[460] Q What did you find when you looked at the accident type?

A Well, I have a list of eight conclusions that you can draw statistically from the sample.

Q Would those conclusions be with the reservations that you have expressed in regard to the recording of the data?

A Yes, sir. The conclusions that I reached—and this [461] is strictly looking at the numbers and comparing them statistically—is that, first of all, semis have a higher rate of turning accidents. If you look at the comparison of turning accidents, twins have 21; semis have 52. If you wanted to compare that on a normalized basis, it is 81, or with the same exposure base almost four times as many accidents for semis, so that is in fact statistically significant.

Semis have a higher rate of rear-end injuries. In other words, the injuries produced by rear-end accidents are significantly higher for semis.

Semis have a higher rate of skidding—of injuries in skidding accidents. Twins have a higher rate of jackknife accidents. Twins have a higher rate of upset accidents.

Semis have a higher rate of multi-vehicle accidents. Now, there I classified head on, parked, stopped, intersection, turning—

* * * *

Q * * * When you say "multi-vehicle accidents," I am not quite clear on what you mean.

* * * *

A Those are head on, parked, stopped, intersection, [462] turning, passing, rear end and sideswipe. I classified those as multi-vehicle; the remainder as single vehicle. I found that semis had a higher rate of multi-vehicle accidents, which is statistically significant again.

* * * *

A Okay, okay. I had said that the semis have a higher [463] rate of multi-vehicle accidents. The semis also have a higher rate of multi-vehicle injuries. All of these are statistically significant. Then the twins have a higher rate of single vehicle accidents, single vehicle being jackknife, ran off the road, skidding and upset.

I might add the overall conclusion that I drew from this analysis was that twins and semis have different kinds of accidents, at least in this set of data. This very well might be attributed to some differences in operating regions, or whatever, but the net result, if you look at this data as it stands, is that twins and semis in this data base have different kinds of accidents, but the net result at the bottom line is that there is no difference in the total numbers of accidents, injuries and fatalities.

* * * *

[466] Q Are some types of accidents, such as jackknifes or upsets—do they seem to bear a close relation to weather conditions.

A Yes. I did investigate that very fact, and here again I used the original accident reports as a source to look at this. What I found was when I looked at— I looked at upsets and jackknifes. I forget which is which. I have got it somewhere, but one of those categories— I believe it was jackknifes—for twins, 87 percent of those accidents occurred from November 1st through March 31st, in essentially the winter months.

On the upset accidents, the percentage was something like 58 percent occurring during those months.

* * * *

[470] Q Okay. What is the practical significance and what is the significance of the matched run analysis?

A I think the importance of this type of analysis is, to the extent that it is possible, we have got what all of these other studies that we have talked about don't have, and that is vehicles that are operating over the same road system, same exposure to the road system, essentially the same exposure to regional conditions and weather conditions, and what have you, so it is—in the sense of normal highway safety analysis is a totally controlled study.

Q Just so I am clear, what you called the matched run analysis, is that the same thing as the matched pair analysis?

A Yes, right.

* * * *

[471] Q Is this a large enough sample so that it provides fairly strong evidence in support of your conclusion?

A Yes, there seems to be some indication earlier that it might not be. This is why we perform and have test statistics which take into account not only what is the magnitude of the difference between the two things you are comparing, but also what is the relative size of the population that that came from. Both those factors come into bear on the statistical test and allow you to look at various size samples, because that factor is accounted for. In other words, if you look at the injuries, for example, people without a statistic background would tend to say, "Well, given that they had the same exposure, and everything, and this one had 27 injuries—the semis have 27 injuries and the twins have 17, that looks like a heck of a lot of difference to me."

The statistical test tells us, "Now, wait a minute. Because of the sample size, I can't say that those are different."

[472] The statistical test is telling us the correct answer in that regard; that you do have to temper your decision based on the sample size.

* * * *

[473] Q Let me direct your attention to— Let me return you to what we initially started off with, your overall conclusion. After performing all this analysis and examining all these details, were you satisfied in your own mind that you were able to draw a conclusion as to the safety of twins and semis?

A Yes. The weight of the evidence, particularly anchored by the matched run analysis, would indicate to me that twins were as safe as semis, if not safer. I am not willing to say in black and white that twins are safer, but I am willing to say that they are as safe as semis.

* * * *

[477] Q Did CF report data to the BMCS study in the years 1970, '71, '72 and '73?

A I believe those are the years, yes.

* * * *

[478] Q What year were they no longer included?

A '74, I believe was the year.

Q Prior to '74 was CF a fairly large part of the total BMCS sample?

A Yes. They represented approximately half of the total sample in the study.

Q If one were to assume that the study contained a bias in favor of twins, and one were also to assume—as we know for '78, but to assume it for the entire period of years—that CF's data is not biased in favor of twins, what should have happened to the accident rates, the comparison of accident rates for twins and semis in 1974 when CF was no longer included in the BMCS study?

A I guess you would expect that the rates would be further apart from that point on than they were prior to that time.

Q The twins would look much better?

A The twins would look much better, right.

Q Would that be because you removed a large block of the entire sample which, at least for purposes of our discussion, we are assuming to be neutral, to have no bias; therefore, the remaining—

A And which demonstrates equivalent rates for both vehicle types, right.

[479] Q Therefore, the remaining part of the sample must have a very strong bias, and if you removed the neutral part, the bias should look larger?

A Very much larger, yes.

Q Does the BMCS data show a larger bias, a significantly larger bias after CF dropped out of the study than prior to it?

A It doesn't show any biases. It does not also show any larger differences, exceedingly larger differences after that time.

Q If there were substantial biases there and there were not substantial biases in CF's data, you would expect to see substantial differences when CF left the study?

A That's correct.

* * * *

[485] Q So, in other words, if the trucks, according to Mr. Wrightson's testimony, that are now diverted around Iowa ran through Iowa on Interstate 80, you would anticipate a reduction in accidents of somewhere around 10 accidents per year for CF, is that correct?

A That's correct.

Q In calculating the accidents for CF, did you use a more conservative accident rate than the Iowa Department of Transportation used in their calculations in the Iowa twin trailer study?

A Yes. My rate is based on the CF experience.

Q And if you used the rate that the Iowa Department of Transportation used, you would find a higher number of accidents resulting?

A About three to four times higher, yes.

Q But your calculation is solely for the accidents for CF whereas their calculation was a calculation for all carriers?

[486] A All carriers, yes.

* * * *

CROSS EXAMINATION

BY MR. PAFF:

* * * *

[489] Q Could we expect that number to increase as a result of allowing 65-foot double bottoms on Interstate 80?

A The numbers in Iowa?

Q Yes, sir.

A Yes, of course.

* * * *

[490] Q Mr. Glennon, do you think that Iowans should be concerned, as a safety matter, allowing a larger vehicle that jackknifes and upsets in snow and sleet on Iowa highways?

A That's calling for a conclusion which is not a conclusion of my work, no. I can't answer that directly.

Q Would that be a safety concern to you personally?

A If, in fact, upsets and jackknifes were inherent characteristics of twin trailers, but from all indications I have, it is not.

* * * *

[491] Q —with regard to the jackknife category—

A Yes.

Q —did you find a significant difference between the categories for twins and the categories for semis?

A That's correct. I also qualified that conclusion.

Q Could you restate that qualification?

A Well, it is very possible—and in the end result I come back to the matched analysis—if there were a large difference between the upset and jackknife characteristics of twin trailers, then you would expect that to show up as a significant difference in the matched pair analysis, but here the suspect is the fact that twins have a considerably higher exposure to ice and snow conditions than do semi trailer combinations for CF's operations.

* * * *

[512] Q (By Mr. Paff) Did the Bureau of Motor Carrier Statistics— Excuse me. Did the Bureau of Motor Carrier Safety do any statistical analysis with the data which they had?

A In a statistical significance testing vein, is that what you are talking about?

Q Yes, sir.

A Not that I am aware of.

Q So when you say "twins have a significantly lower accident rate", in what sense do you mean that based upon that study?

A Based on the numbers in that table. As all of the studies that are summarized in this table on Page 3, what we are saying is this is the result of the data in the study. Now, in some cases it was the result of the author. In this case it was the result of us applying the stated statistical test to this data. That is conditional upon statements like you were making earlier concerning testing, whether there are biases associated with drivers and roads, and so forth.

Q But your test didn't eliminate any bias that might already be present?

A None of the studies that are listed in this table, no.

Q Now, with regard to what's purported to be measured in Plaintiff's Exhibit 22, could it be in fact we are measuring the difference in roadways upon which these vehicles are operating?

[513] A I think we addressed this question a little earlier in talking about my three-stage analysis that I did, and it was something that I didn't go into in too great a detail, but I treated the BMCS data in several ways by taking Consolidated Freightways out of it completely, by adding Consolidated Freightways in in the later years and manipulating it several ways and, you know, if the biases didn't exist in the Consolidated Freightways' data and those kinds of things were done, then you would expect to see a vast change in the BMCS data because of these other carriers. That didn't seem to be apparent.

Q I don't really understand what you just said, but apparently what you said was that you went back and after you saw CF data in 1978, you came to the conclusion that these tests or these numbers that were presented in this exhibit had some significance.

A I am willing to say, based on my total analysis, that what this table would indicate to me is that very definitely twins are not less safe than semis, yes.

Q Could we say that twins were safer than semis based upon—

A I wouldn't be willing to say that, no.

Q Can we say anything at all about the relative safety between a 65-foot twin and a 60-foot twin?

A Not directly, no.

* * * *

[520] Q With regard to the final report [the BioTech Study] which you testified to, what was the conclusion of the report with regard to twins regarding a fatality rate?

A That's quoted in the table here. The twins had a significantly higher fatality rate.

Q Do you think Iowans should be concerned—have a safety concern about allowing a bigger vehicle in the traffic stream that will have a higher fatality rate?

A If that in fact was true, yes.

* * * *

[521] Q Now, if we go over to the fatality column, and if you corrected for what you claim to be a demonstrable bias, do we have any significant difference in the fatality rate between twins and semis?

A Yes, using the statistical tests that I have exhibited in this exhibit, there is a significant difference between twins and semis on the accident rate, the twins having a lower rate.

Q Are we now on the corrected line, sir?

A Correct, yes.

Q I was referring specifically to the fatality column. I may have misspoke.

A I'm sorry. The fatality rate shows no significant difference with the corrected. Also the injury shows no significant difference, injury rate.

Q Is whether or not there is a demonstrable bias within a certain set of data a matter of judgment or a matter of concern with regard to judgment?

[522] A This is a matter of fact in this case. The numbers are in the report. It is demonstrable that the accidents are 98 percent rural representation, and that the stations of the counts were some only 70 percent rural, and it is also demonstrable that the proportion of trips in urban areas is higher for semis than it is for twins. All those things are demonstrable in the report itself.

* * * *

[524] Q If it were true that Consolidated Freightways were diverting semis around Iowa that they could lawfully operate on the interstate highway system, would that increase the number of accidents that they would experience based upon exposure?

A If they went through Iowa instead of diverting around?

Q Yes.

A That would decrease the number of accidents, as I have testified.

Q Would that be true today with a 55-foot semi; that they could lawfully— If they ran a 55-foot semi around Iowa, would they be exposing that particular vehicle to a greater chance of an accident than taking it through on Interstate 80?

[525] A If the diversion, in fact, was an additional mileage, yes, that's correct.

* * * *

[549] Q (By Mr. Paff) Isn't there a problem when you have a bias in statistics related to roadway type?

A If that bias exists, yes.

Q And the problem with the BMCS data is that it was not controlled for roadway type?

A I would agree with that.

Q And so that you might be measuring differences in [550] roadway type within that study rather than making a safety comparison between twin trailers and semitrailers?

A But the inference from the CF data is if there is a bias, it favors the semis in comparison.

Q I understand that point, Mr. Glennon. The question was that bias was not controlled for in the BMCS data, was it?

A That's correct.

Q Similarly, with regard to all the other calculations that you have made in Exhibit 18, driver factors were not controlled?

A In Exhibit 18?

Q Yes, with regard to the BMCS data.

A Correct.

* * * *

[565] Q (By Mr. Paff) So with regard to your testimony and your matched pair analysis, is it a fair statement that 80 percent of the CF data is discarded?

A I don't know what the exact number would be. Are you talking about the mileage data, or the accident data, or what portion of what? I don't have an exact figure on that.

Q Well, assuming the miles traveled by— Were you here when Mr. Gunn testified?

A Yes.

Q And do you have any reason to doubt— Were you here when we went through the total number of miles in 1978?

A I believe I was, yes. The 80 percent sounds reasonable to me, somewhere around that number, but I don't know what it is exactly.

Q So isn't the problem with the matched pair analysis— Is the problem with the matched pair analysis that you reduce the sample data size that you are dealing with?

A There is no problem with the matched pair analysis, in my estimation.

Q Well, is that a possible problem with the use of a matched pair analysis?

A Not in the sense that I have used it, no.

Q For example, could we see a significant difference between fatality rates when all we had was one particular accident?

[566] A It is not— No, that would not be enough to judge very much there.

Q Could we see a significant difference between the injuries for twins and the injuries for semis based upon that sample size?

A You could, yes. It is possible.

Q Would you make that conclusion?

A Would I make what conclusion? I just made a conclusion.

Q You would say there is a significant difference between—

A I didn't say that, sir. I said there could be a significant difference with this size of a sample.

Q Did you make that calculation?

A The significance?

Q Yes, sir.

A Yes, I did.

Q And are you testifying that there is a significant difference?

A No, I'm not.

Q Now, with regard to all twin accidents and semi accidents under your matched run analysis could we make the assumption that the accident frequency for twins is significantly higher than the accident frequency for semis?

A No, you can't.

Q So if I look at the rates that you've caluculated, am I to assume that the injury rate for semis is higher than the [567] injury rate for twins?

A No. What the rate of that sample is, the decision on statistical significance says I cannot distinguish a difference between those two numbers; that that difference could have occurred by chance.

Q What chance do you have of finding a significant difference based upon that sample size?

A I'm not willing to speculate on that. That's a fairly—

Q Have you made such a calculation?

A No, I have not.

Q Do you know how disparate the figures would have to be in order to detect a difference in rates?

A I did do that.

Q What did you establish?

A For example, on the injuries, in order for the twins to have a higher injury rate than the semis, it would have required 44 injuries for twins rather than the 17.

Q Okay. Did you do it the other way?

A No, I did not.

Q How about all accidents?

A With all accidents, it would require 130 twin accidents for the twins to be significantly higher than the semis.

THE COURT: Instead of how many?

THE WITNESS: Instead of the 106.

[568] Q (By Mr. Paff) Did you work it the other way?

A No, I did not.

Q Did you do it with fatalities?

A Yes, I did. Fatalities would require seven twin fatalities to be significantly different than the one semi fatality.

Q Did you work that category the other way?

A Again, no.

Q Are you trying to say with this particular analysis and these particular figures that unless we saw gross differences, we should assume that twins and semis are the same?

A I'm not saying that at all. All I say is that this analysis indicates that there is no difference.

[575] Q So could we state that based upon 1978 CF accident records by road condition, the data indicates a significant difference between the accidents occurring on ice for twins as opposed to accidents occurring for semis?

A That is correct.

[576] Q (By Mr. Paff) Did you compute dry conditions?

A Yes, I did.

Q Did you find significance there?

A No, I didn't.

Q Did you compute snow, sir?

A Yes.

Q And did you find significance there?
A No.
Q Did you compute wet conditions?
A Yes, I did.
Q And did you find significance there?
A Yes, I did.
Q And with regard to that significance, could we state that based upon 1978 CF accidents by road condition, that the semis have fewer accidents under wet conditions than do the twins?

* * * *

A No. It's the other way around.
Q Why don't you state correctly what it is?
[577] A The semis have a significantly higher rate of accidents under wet conditions than do the twins. I gave that conclusion yesterday.

* * * *

[578] CROSS EXAMINATION

BY MR. LAMBERT:

Q Sir, has your analysis, including your matched pair analysis, then directed toward the relative safety of 60-foot twins with other vehicle lengths and types?
A No, it has not.
Q Have you addressed the relative safety of 60-foot twins to other vehicle types?
A There is no way in the accident data to address that question.
[579] Q So you are expressing no opinion upon that relative safety?
A Of 60-foot versus other types?
Q Yes.
A No, I'm not.

* * * *

Q And you haven't made the conclusion that twins are more safe, is that correct?

A That's correct.

* * * *

[580] Q Based upon your study of the BMCS statistics, is it your opinion that the BMCS study shows that doubles are safer than singles or semis in terms of the number of accidents per hundred thousand miles?

A I just made a statement in that regard. No, not taking the BMCS study by itself, no.

Q If I asked you the exact same question in regard to [581] injuries per hundred thousand miles, what would be your response?

A It would be the same.

Q If I asked you the same question in regard to fatalities per hundred thousand miles, what would be your response?

A The same again.

Q And if I finally asked you in terms of the amount of property damage and the number of injuries and fatalities per accident, what would be your response?

A I have no information in that regard.

MR. LEDERER: Pardon me, counsel. Are you asking about conclusions in general, or are you asking about the specific statistical significance of the BMCS study?

MR. LAMBERT: I am asking specific questions about specific areas in the BMCS study and what his opinion is.

* * * *

[582] REDIRECT EXAMINATION

BY MR. LEDERER:

Q Dr. Glennon, to return to that last question so it is clear in my mind, your analysis of the BMCS study showed that there were statistically significantly lower accident and fatality rates for twins, is that correct?

A That's correct.

Q For the study?

A Yes.

Q But your conclusion as to the overall safety of twins and semis is not based alone on the BMCS study?

A Definitely so, yes.

* * * *

[583] Q And what percentage of the total CF mileage for 1978 is represented in the matched pair sample?

A It is approximately 28.5 percent.

Q And that percentage would be determined by taking the 112 million miles in the sample and dividing that by the total CF mileage of about 393 million miles?

A That's correct.

THE COURT: That's 28.5 used in the matched pair analysis?

THE WITNESS: Yes, 28.5 percent of the trips.

[584] Q (By Mr. Lederer) Is that a fairly large proportionate sample of CF's 1978 data?

A I would say it was, yes. It is very close to the maximum sample we could have obtained, given all the controls were exerted that we could exert.

Q In other words, turning to that for just a moment, if you desired to obtain in all respects the same number of semi and twin trips over the same routes under the same conditions, this would be about the largest sample that could be obtained?

A Very close to it, yes.

Q Okay. Instead of randomly balancing the sample, if you had instead for each terminal pair taken the trips and taken a percentage of the accidents associated with those trips, would that weaken the control of the study?

A Weaken may be a little soft in that regard. It might destroy the control, because when you accumulate all the individual pieces of the sample, which are terminal pairs, by month, your cumulative total would not have the same proportions of similar road mileages—would not necessarily have. We would have no idea whether it would or not.

Q With the sample that we had, can we be sure that in all respects, as regards routes and the conditions on those routes, at least if we assume the conditions are randomly distributed, that we have obtained samples that have exactly the same type of environmental conditions and exposures?

[585] A That's correct.

Q (By Mr. Lederer) At one point in cross examination counsel asked you if in your analysis you had controlled for certain of the roadway factors that were mentioned in your Exhibit 18. I believe you mentioned hills and width of pavement.

A Yes.

Q Would those have been controlled for in the matched pair analysis?

A Yes, they would have.

* * * *

[586] Q I believe it is fair to state that Mr. Paff has [587] implied that based on some of the accident statistics in Exhibit 18 regarding twin accidents on ice, snow and sleet, that there is an implication that twins are less safe.

* * * *

Q (Continuing) Could you state whether you agree with that implication?

* * * *

A I tend not to agree with that, the reason being that it seems to be fairly evident from the analysis that the twins are much higher—have a much higher exposure to the ice and snow conditions, so it is not necessarily an inherent characteristic of the vehicle.

Q (By Mr. Lederer) If the difference is the result of the differences in exposure, then regarding the fact that Iowa is a state in which there is snow and sleet and winter conditions in the winter, would there be any difference in the accident rates for semis and twins if twins were permitted in Iowa?

A Not if that were entirely due to exposure, no.

Q Did semis have a significantly higher number of accidents on wet pavement than the twins?

[588] A Yes, they did.

Q Is it your conclusion that that too is probably the result of differences in exposure?

A Yes, it was.

Q So you would not then decide that twins would have a higher number of accidents in Iowa because it rains in Iowa?

THE COURT: Semis, you mean?

MR. LEDERER: Semis.

A That's correct.

* * * *

[589] Q Dr. Glennon, in regard to the jackknife and upset rates of the twins and semis, is there a significant difference in the rate of injuries in the upset accidents for semis and twins?

A Yes, there is.

Q Which one is higher?

A The semis have a significantly higher rate of injuries per accident than the twins do.

Q In jackknifes, at least for twins, are those accidents that have a relatively low proportion of injuries in comparison to other types of accidents—

A Yes. They are, yes.

Q —which would seem to indicate that those are not very severe accidents?

A Yes. In terms of producing injuries, yes.

Q Turning your attention to Page No. 9, are rear-end accidents accidents which produce a relatively high number of injuries?

A Yes, when a truck is involved, that's correct.

Q Did semis have a statistically higher number of rear-end injuries than did semis— I'm sorry. Did semis have a statistically higher number of rear-end injuries than did twins?

A A higher rate of injuries, yes.

* * * *

[590] RECROSS EXAMINATION

BY MR. PAFF:

Q Mr. Glennon, I have just one question with regard to your table on CF road accidents on Page 9 in Exhibit 18.

With regard to the accident type of jackknifes and upsets, what really reaches out and grabs you, isn't it, is the tremendous disparity between the twins and the semis relative to the turning accidents? For example, you testified that [591] you would imply that for turning incidents, you could make an implication from turning accidents, but you couldn't from the tremendous disparity in the jackknife and upset category.

A I didn't say that, sir. I said that both of those were statistically significant, both of those conclusions.

* * * *

[592] Q We could expect more jackknifing and more upsets with twins and semis?

[593] A I think that's a matter of speculation. I am not prepared to speculate on it.

Q But it is true that one could get that idea from looking at those figures?

A One could get that idea, yes, right.

* * * *

[602] JOHN J. KILLILEE

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name and spell your last name, and give your address?

A John J. Killilee, K-i-l-l-i-l-e-e, 1431 Prince Edward Way, Sunnyvale, California.

Q And by whom are you employed?

A Consolidated Freightways.

* * * *

Q Okay. What is your position with Consolidated Freightways?

[603] A I am the Directory of Safety.

* * * *

Q Can you indicate the nature of your job experience with Consolidated and the types of positions you have held?

A I started with the company as a transport operator, which is a road driver, in Buffalo, New York in 1963. In 1969 I became a safety supervisor in Buffalo, responsible for New England. In 1971 I was moved to Akron, Ohio as our eastern area safety manager.

In late '73, I became eastern area personnel manager, and in 1977 went to Menlo Park as the Director of Safety.

* * * *

[610] Q In connection with your various safety programs, do you treat twin and semi road operations differently?

A No.

* * * *

[626] Q (By Mr. John Varda) Now, sir, does Exhibit 28 carry out for the years 1974 through nine months of 1978 the same information as reflected on Exhibit 522 on the basis of property damage of $250 per accident?

A I guess— Did you indicate all the way through or—

Q From 1974 through the nine months of 1978.

A Okay. Yes, it represents the $250.

Q Was there some kind of manual work done to provide that information on the $250 basis rather than the $2,000 basis?

[627] A Yes.

Q Was that done at the request of counsel?

A Yes.

Q What would the source document be for the information reflected on Exhibit 28 for the years 1974 through the first nine months of 1978?

A The accident report.

Q You went back to the actual accident report for the period rather than any of the standard computer reports?

A Every darn report.

Q You say that with a little emphasis. Can you indicate what it took to provide that information?

A It look four Kelly people a week and I think it was a day, if memory serves me right, and the supervision of my staff assistant for that period of time.

* * * *

[632] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[634] A Well, okay. I will read it. It went to Ron Burbank, Building, a copy to L. Scott, who is the Executive Vice President of Operations, my boss.

"Attached is information you requested pertaining to Senator Kennedy's proposal to trailer length plus 15 foot:

"1. 80A publication entitled 'The Case for Twin Trailers', dated September '77. This publication contains much of the information you requested.

"2. CF's accident frequency for twin trailers versus semitrailers, '70 through '77."

THE COURT: Give me that a little slower. What was that?

THE WITNESS: Yes. No. 2 was "CF's accident frequency comparison for twin trailers versus semitrailers for 1970 through 1977."

MR. JOHN VARDA: Is that document Exhibit 22—excuse me—522?

MR. PAFF: 522.

THE WITNESS: This is the cover letter to that.

MR. JOHN VARDA: I just want to make it clear.

THE COURT: The one you listed there was 522?

MR. PAFF: Yes, Your Honor, that's correct.

A (Continuing) No. 3, "1973 accident comparisons of [635] twin trailers versus semitrailers by four other carriers.

"4. Turning and tracking sketches.

"5. List of influential people who spoke out for twin trailers in the recent Wisconsin lawsuit."

No. 6 was some general comments, but they were by me.

Q (By Mr. Paff) Now, with regard to that exhibit, does that fairly and accurately represent the entire memo and the entire collection of data that you forwarded to the President at that particular time?

A Yes. Yes, that's the whole thing.

MR. PAFF: We would move for the admission of 524, Your Honor.

MR. LEDERER: No objection.

THE COURT: Received.

(Defendants' Exhibit No. 524 was received in evidence.)

Q (By Mr. Paff) Now, with regard to that particular exhibit, what was your understanding of the Senator's proposal with regard to truck length?

A He was taking about the length of a trailer plus 15 foot, so that configuration would have put us out of business, as far as 65-foot twins.

* * * *

[663] ELDON J. YODER

called as a witness by Plaintiff, being first duly sworn by the Clerk was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name for the record, spell your last name and give your address?

A My name is Eldon J. Yoder, Y-o-d-e-r. My address is 433 Maple Street, West Lafayette, Indiana 47806.

Q And what is your occupation?

A My primary job is I am an engineer and professor. I teach at Purdue University.

THE COURT: Teach where?

THE WITNESS: Purdue University.

Q (By Mr. John Varda) And what is the position you hold with Purdue University?

A I am professor of highway engineering in charge of pavement design, and I might add, since the bibliography was made, I have since been made head of transportation engineering and urban engineering.

Q If you will direct your attention to Exhibit 29, and starting with Page 9 of that Exhibit, have you set forth a resume of pertinent facts about yourself?

A As I pointed out, my present job primarily is at Purdue, although obviously I am not here representing Purdue. [664] I have worked in the pavement design for about, oh, 20, 30 years. I have prepared two textbooks on the topic.

I have prepared numerous research papers. I think they number over 100. At the present time I do consulting work for various agencies, various states, various governments. A considerable amount of my consulting work is overseas. I work consulting for the Federal Highway Administration, the World Bank, development banks, other loan agencies throughout the world.

Q What is the nature of that— Why would you be working overseas, and why would a banking institution desire your expertise?

A It is primarily referee work. In fact, I would say of the consulting work I do, probably 90 percent of it lies in the area of what I would call referee. This would be where a lending agency, for example, had a contract in a country with an engineer for a design job, and some dispute came up, and I would be called in to give an expert opinion.

Q What would the nature of the—the subject of these disputes that you would address, what would that be?

A Pavements and pavement performance.

Q You did not mention doing consulting work for attorneys. Is that a usual part of your consulting work?

A No, that is not a usual part. I have done some, but it has more or less been of a minor nature.

* * * *

[666] Q What was the basic result of the AASHTO road test in terms of the current state of the art in road wear analysis?

A I would say that so far as highways are concerned, that it is probably, if not the sole method used throughout the world, it is the primary method used throughout the world.

* * * *

[669] Q What is the unit of measure of the wear of a road by a vehicle?

A It is in terms of what we call equivalent axle loads. In the work that I have done, I refer to the term EAL. I believe it is widely accepted, although there are some who use other terms, but it is equivalent axle load, and it refers back to the number of equivalent 18,000 pound-axle loads single. This was adopted primarily because at that point in time most state laws permitted 18,000 pounds on a single axle.

* * * *

Q (By Mr. John Varda) What have you basically set forth on Page 1 of Exhibit 29?

A The equivalency factors as developed on the AASHO road test and, incidentally, I still use the word AASHO although some use the word AASHTO. In the AASHO road test, they equated the distress causing function of various vehicles of various weights and of various wheel configurations. Specifically, they were for single axles and for tandem axles of various weights. On the road tests, the weights range over a very wide range, and everything so far as the performance of the pavement was related back to the number of equivalent 18,000 pound single axle loads.

* * * *

[672] Q Now, in preparing to give your testimony in this proceeding, did you conduct a field inspection of Interstate 80 in Iowa?

A Yes. I inspected I-80 starting at the east end. This was done in mid-April. I drove primarily on the westbound lanes, although, as I usually do in inspecting pavements of this type, I doubled back about every third or fourth interchange to make sure that what I saw on the westbound lane was the same as I saw on the eastbound lane, and I inspected all of I-80 from the Mississippi River to Council Bluffs, and then I went down I-29.

Q You went down I-29?

A Then I went across U.S. 36 in Missouri.

Q Did you inspect U.S. 36 in a similar manner?

A Yes, I did.

Q Would that have been all the way across Northern Missouri?

A That is across—In this case I drove from West to East. A large portion of that pavement is two-lane, so there wasn't much need for doubling back.

[673] Q Could you describe, in general terms, what you do in the course of making an inspection and how

you conduct the inspection and what type of records you make of your inspection?

A My own method of inspecting roads—and, incidentally, I should point out that my primary job in Indiana is of that type for the Indiana Highway Commission—is to record on tape what I see as I drive down the road slowly, as slow as the traffic will allow, and I stop on the shoulder whenever I can, although it is very dangerous. I get out and inspect it personally when I can, although this is very dangerous, and I make note of the condition of the road. I make note of the soil conditions, the type of pavement and all other features that might be relevant to the evaluation.

Q Can you give us some examples of pavement features that you would particularly note?

A For example, on I-80 there are three basic soil types. Starting at the Mississippi River, the road crosses a relatively flat area, which is an alluvial—a-l-l-u-v-i-a-l—soil, which is associated with the Mississippi River.

It then rises up into the typical Iowa soil, which is a windblown silt. It is called a loess, l-o-e-s-s. Crossing by Des Moines it now enters a glacial drift area, which is a little different type of soil, and then the soils stay the same over as far as Council Bluffs. In fact, Council Bluffs is named after the bluffs that have been pushed up because of [674] the wind.

Other than soil conditions, I make note of the conditions of the road, the conditions of cracks, the location of cracks on I-80. The joints are spaced quite far apart, 76½ feet on centers. On the east end many of the transverse cracks are severely faulted. The cracks have pulled apart, suggesting that perhaps the steel was broken.

Coming on across, I found some asphalt pavement. At the time of my inspection I wasn't sure whether it was truly an asphalt pavement or an overlay pavement, but I straightened that out this morning as well. It is a little bit of both.

The performance in the loess is primarily longitudinal tracking, which is subgrade associated through the cut areas.

Again, passing on towards the west, as a general statement the primary problems again are joint problems. They have transverse cracks, and as we proceed on toward Council Bluffs, I encountered about 40 miles of continuously reinforced concrete pavement, which is a pavement with no joints, which was adopted almost nationwide because of joint problems we were having.

Q Now, did you make a similar observation with respect to Highway 36 in the State of Missouri?

A I did. U.S. 36 in general is a much older pavement and, as a result, the wear has been more severe. The grading alignment more or less follows the grade. The soil conditions [675] in Missouri are, I would judge —I would have to say they are worse than in Iowa because it is on what we call old drift. This is glacial drift materials of older age, and they are quite plastic. I did notice some swelling and some other associated problems.

* * * *

Q Do you have, as a result of this inspection, an opinion as to whether there is any reason to exclude 65-foot twin trailer combinations from Interstate 80 in the State of Iowa?

* * * *

A I would have to say, first of all, in general comparing, the distress caused by a truck is decreased the longer the distance between the axles. This is a known fact, and the reason for this is because of what we call relaxation between the time one axle hits and the other axle hits.

* * * *

[676] Q Would a twin trailer combination of the type that we have discussed in this proceeding or a 55-foot semi combination with tandem axles—which would tend to aggravate the joint problem more?

A Tandem axles. This is one of the things that was fortunately brought out on the AASHO road tests. For joints that are in various stages of deterioration, tandem axles just—

Q Can you give a little explanation as to why that happens, looking at the joint?

A Yes. For example, if this edge of the page were the joint, when a tandem axle crosses a joint, there is one instant of time when the wheels are straddling the joint and, as a result, it gets a double hit all at once as opposed to a single axle that hits on one side and then on the other side, and the equivalency factors show this out.

Q Now, based upon your inspections as between Highway 36 in Missouri and Interstate 80 in Iowa, from the standpoint of road wear, on which is it preferable to have twin trailer traffic move?

A I would say in general, because of the joint problems and crack problems I have seen on this pavement, on I-80, that if I had the chioce, I would prefer single axles.

* * * *

[681] Q Now, if we go back to Page 2 of Exhibit 29, you have laid out there five cases. Did you calculate the EAL's for the respective vehicle types for each of those cases?

A That is correct.

* * * *

Q Can you go down through the five cases and explain why each case was chosen to perform this analysis?

A Yes. Case 1 is—corresponds to the legal axle loads [682] in Iowa at the present time, 73,280 pounds gross, 32 pounds tandem and a 9,000 pound single—or 18,000 pound single. Excuse me. 9,000 pounds is generally accepted to be the load on the steering axle.

Case 2 was for comparison purposes primarily. That should any weight law changes be made at all—Many states have an 80,000 pound gross, so I made the same calculation for the 80,000 pound gross, the 20,000 pound single and 34,000 pound tandem. On Case 3, according to the CF proposed loading, they shift the load forward just a bit on the forward axles, as brought out by the previous gentlemen, so I remade the calculation for the shift according to the CF loading chart to compare with Case 1.

Case 4 was taken directly from the Iowa DOT study of 1975 for comparison purposes, and Case 5 were the values taken from the loadometer studies or specifically from the W-4 forms that are prepared by the FHWA for every state and for several highway commissions.

* * * *

[684] Q For these cases, what is your general conclusion with respect to the EAL's produced by twins and semis respectively?

A For concrete pavements and for the conditions set out herein, the semis, and correspondingly the tandem axles that go with the semis, generate more equivalent axle loads than the twins.

Q Just to get down to my phraseology, does that mean the semis create more road wear than the twins?

A That is correct.

* * * *

Q (By Mr. John Varda) Now, you chose to use the calculation that relates to a concrete pavement?

A Yes. At the time that the computations were made, according to the best information I had on hand, the pavement—I was thinking primarily of the interstate pavements in Iowa—[685] I found were almost exclusively concrete pavement; however, I have found out since, both on my logging of I-80 as well as an interview this morning with some gentlemen from the DOT, that there are some asphalt pavements on the interstate system.

Q Now, going back to the EAL calculations, are there separate formulas for concrete or rigid pavement and for asphalt or flexible pavement?

A That is correct.

Q You have here made a choice to use the concrete or rigid pavement formula?

A That is correct.

Q Did you receive a sheet that gives the respective miles on various sections of the interstate systems in Iowa by pavement type?

A I did.

* * * *

[686] Q Let's go back and get the total figures for the interstate system in Iowa, including all portions of the system.

A All right. First asphaltic concrete, the total is 68.1 miles.

THE COURT: 68.1?

THE WITNESS: That is correct.

A (Continuing) .08 on I-29; 9.92 on I-35 and 58.10 on I-80.

Asphaltic concrete on Portland cement concrete, the total is 66.55 miles; 25.6 on I-29; 24.95 on I-30; 0.11 on I-235; 16.89 on I-80.

Portland cement concrete, 593.63 miles total.

Q Now, with respect to the EAL computations that you have done for the five cases in Exhibit 29, would you come out with a different result if you used the flexible pavement formulation?

A That is correct.

Q What would be the nature of the difference in the result?

A It almost completely reverses itself.

Q So using the flexible pavement formula, the twins would show up with more EAL's than the semis?

A That is correct, and the reason being primarily tandem axles at joints and cracks.

* * * *

[687] Q Now, when we go back to the figures for the interstate system of Iowa, we have 66.55 miles of asphaltic concrete on Portland cement, is that correct?

A That is correct.

Q With respect to the rigid and flexible pavement formulas, which is appropriate for that mileage?

A The Portland cement, because of the rigidity of the slab.

* * * *

[688] Q With respect to the 68.10 miles of asphaltic concrete or flexible pavement, did you do some investigation this morning?

A Yes. I should repeat my reaction when I inspected the road. I can recall stopping at one point to the west of Des Moines, and I sat there about a half hour debating in my mind if that was an overlaid concrete pavement or if it was an asphaltic concrete pavement. The crack pattern did not reflect what a concrete pavement should do in that on a concrete pavement the reflection cracks go straight across on the joints. These tended to go off on a little bit of a slant. I concluded at that time that that had to be, although I wasn't certain, from what we call deep-strength asphalt or full-depth asphalt, and it was thermal cracking. That was verified this morning.

Q Now, what effect does that verification or that fact have on the use of the rigid pavement or the flexible pavement formula in calculating the EAL's?

A What we call deep-strenght asphalt or full-depth [689] asphalt approaches about two feet. In fact, the whole depth on I-80 in one case is 23½ inches, and the other is 19¼ inches. That depth of asphalt makes the asphaltic concrete begin to behave as a rigid pavement, particularly when thermal cracking takes place.

Q So it is really the standard to which the state has built that pavement that brings it closer to a rigid pavement than a flexible pavement?

A That is correct, and this is true all over the United States. We are building more and more full-depth asphalts, and they do behave more and more like rigid pavements because they are more rigid.

Q Is it closer to being a rigid pavement than it is to being a flexible pavement, as would be computed under the flexible pavement EAL's?

A It is my opinion, and this would be based upon the flexion measurements that we have made in our own state, that it approaches the rigid pavement more closely than the flexible pavement.

* * * *

[694] Q Did you total the total EAL miles from these three calculations?

A Yes. My answer, assuming there is no mistake in arithmetic, is 109,290,592.

Q Is 109 million EAL miles a small figure or a large figure?

[695] A It is a large figure. In fact, you must remember that these are added miles. These are not actual miles. These are added miles and, as I understand the traffic pattern, if these trucks were to pass through Iowa, it would drop to zero, because these are added miles.

Q These are the miles—Your understanding is that these are the miles that result from going around Iowa?

A These are added miles.

Q Would the elimination of these added EAL miles reduce road wear overall?

A Yes, it would reduce road wear over these 4,700 miles of pavement. I don't know where they are. Some of them are in Indiana, Illinois, Missouri; spread around.

Q Could there be additional road wear in the State of Iowa?

A Yes, certainly.

* * * *

[696] Q Did you review some purported-to-be road wear analysis by a Mr. Hall in connection with this proceeding?

A I did.

Q Was his analysis done correctly?

A I must admit I simply couldn't follow what he did.

Q Do you have an opinion as to whether he appropriately applied the EAL calculations?

A As nearly as I can tell, I believe he used the load weight rather than total weight, but I am not positive of that either.

Q Would using the weight of the load as opposed to the gross weight of the vehicle be an appropriate procedure in developing comparative EAL's for vehicles?

A No, no. It must be the gross weight.

THE COURT: He used the load weight?

[697] THE WITNESS: As far as I could tell. I frankly admit that I have studied it and studied it, and I cannot quite follow the computation.

Q (By Mr. John Varda) To be very clear, it is the load weight or the payload rather than the gross weight?

A Gross weight, I am sure of that, yes.

Q Using the payload rather than the gross weight would not be an appropriate procedure?

A No.

Q Do you know whether Mr. Hall applied a rigid or flexible formula?

A Again, I couldn't quite decipher that. I concluded, in my own mind, however, that since his calculations showed, I believe, the twins to be eight times as more destructive—I believe this is the figure he had—as the semis, that he had to use the flexible factors, but I can't say that with certainty.

* * * *

Q Would it be appropriate to use the flexible pavement formulation in addressing the subject of EAL's or road wear on the interstate highways in Iowa?

A No. The interstate, in fact, if we take the eastern part of the United States, New York, Ohio, Pennsylvania, Indiana, Illinois, Iowa, they are nearly all concrete pavements. [698] There is some asphalt pavement. The asphalt pavements are used largely far out west, some in the south, but Iowa is definitely concrete.

* * * *

CROSS EXAMINATION

BY MR. PAFF:

* * * *

Q How many miles are in the primary system related to asphalt?

A I have 5,459.22 miles on asphaltic concrete, 3,748.45 miles on Portland cement concrete.

* * * *

[699] Q (By Mr. Paff) So with regard to the primary highways in the State of Iowa, which calculation would be appropriate for the 5,459.22 miles?

A The flexible pavement equations.

Q Does that show the twins doing more damage than the semis?

A I believe it would.

* * * *

MR. JOHN VARDA: I am going to object to this question, Your Honor. It is certainly beyond the scope of the relief [700] sought in the proceeding, and I did not interpose the objection to start with, but counsel is going to argue with the witness about a matter which is not at issue in this proceeding.

MR. PAFF: Your Honor, I think that matter is in issue, and I think with regard to the pavement wear in the State of Iowa that that is a concern. I don't see how the relief can be narrowed.

THE COURT: Well, I will take it subject to the objection. As I understand it, the relief request is limited to the interstate and access to the interstate, but go ahead. I will take it subject to the objection.

* * * *

[701] Q Do you know how many miles of asphalt paving are within a five-mile belt of Interstate 80?
A No.

* * * *

[702] Q I am not talking about the operational aspect, sir. I am talking about the 55-foot semi, which could legally operate in the State of Iowa, being sent on a circuitous route. Isn't that in effect causing pavement wear that could be eliminated by a more direct route?
A Yes.

* * * *

[705] Q With regard to Case 2, if we looked at a 60-foot twin instead of a 65-foot twin, would those calculations remain constant with regard to the EAL configuration?
A On the twins?
Q Yes, sir.
[706] A No. I think they would increase.

* * * *

Q That I understand. But with regard to the 65-foot twin and the 60-foot twin in Case 2, would your calculations indicate it being comparable to the double pictured there or comparable to the semi?
A Oh, I see your question. Would it be more like the double than the semi?
Q Yes, sir.
A I think it would be more like the double.

* * * *

[707] Q And could you read for us the first sentence in the CF loading manual?

A "Importance of load factor"?

Q Yes, sir.

A "In basic simple terms, load factor is the prime importance for profits, because when more weight is loaded on each trailer, less trailers will have to run."

* * * *

[708] Q And in another portion of that document, is there an indication with regard to what an extra 100 pounds in each truck means in terms of profits?

* * * *

A "An increase of 100 pounds in average load factors will increase system profits by over $58,000 per year using 1976 figures. An increase of 500 pounds in average load factors will reduce the system operating ratio one-half, by increasing profits over two million five."

* * * *

[719] RICHARD D. MARKLAND,

called as a witness by Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

Q Sir, will you state your name for the record, and spell your last name?

A Richard D. Markland, M-a-r-k-l-a-n-d.

* * * *

[720] A Vice-president, equipment purchasing—maintenance purchasing, I beg your pardon.

Q Can you explain what your general responsibilities are in that position?

A I am in complete charge of our tire program, our fuel program, all test programs, all R & D, and sundry other assignments.

Q R & D is research and development?

A That's correct.

* * * *

Q Can you go through and, in a summary way, explain the various positions you have held and the types of responsibility you have had with the company over the years?

A I started working in the parts department, held every position in the shop. I was an equipment inspector, rough estimator. I was in the original research and development group.

I was the company draftsman for several years. I was in operations for five years, wherein I was a salesman, a sales [721] manager, an operations manager, a dispatcher.

I went back into maintenance, where I was the western equipment engineer, which was for Chicago and West for the company at that time.

I went through from being the director of maintenance to vice-president of maintenance to my present assignment.

* * * *

[722] Q Do you personally hold any patents related to equipment design?

A Yes, I do.

Q Can you give us a couple of examples?

A The fuel heater device that heats fuel from the return fuel of the engine for winter operation; the turbocharger wherein I designed it using the turbocharger as a centrifuge to clean the air prior to going into the engine.

We have a remote tire pressure monitor we have been working on for a number of years. I have the patents on that.

* * * *

[729] Q Do you conduct tests on your company's vehicles with respect to fuel economy?

A I do.

* * * *

[737] Q Is the fuel economy related to the weight of the vehicle and load, the gross weight of the vehicle?

A No question about it.

Q Is there any difference in the fuel economy of a twin and a semi, except as related to weight?

A No.

* * * *

[749] Q Can you explain what component parts are different as between semi—let's take the power unit—between semis and twins?

A Certainly. At Consolidated Freightways, the only [750] difference in the power unit between what is referred to as a six-wheel vehicle, or the power unit that pulls one long semi, versus the single axle vehicle that pulls two double trailers—you will have to envision this —envision the single axle trailer, and then just extend the frame rails, add an axle, and its suspension, and relocate the fifth wheel. Everything else is exactly the same. There isn't any difference.

* * * *

[756] Q In connection with preparing your testimony for this proceeding, did you have an opportunity to read a portion of the deposition of Defendants' witness Leo C. Peters, dated May 23, 1979?

A Yes, I did.

Q Let me read you a short portion of his testimony at Page 3 of that deposition. It says, "I would anticipate testifying that at this moment that I have found no evidence that shows me conclusively that 65-foot twin trailer units are as safe as semis. I will testify that there are added components in the 65-foot twin trailer units that increase the probability of malfunction for the train as a whole, and that these components can be thought of in a couple of different ways. One is that there are two additional braking systems that are involved, where I would define braking systems as being additional hoses, additional connections, additional valves, additional air tanks."

Does the increase in the number of component parts, hoses, connections, air valves and air tanks, increase the probability or possibility of failure of the component parts?

[757] A Anytime you have more, the possibility of having a problem becomes greater.

Q Are failures of braking system components frequent or rare events?

A They are rare events.

Q In the event of failure of any of the components, any of the components of a braking system, would I be better off in a twin or in a semi?

A It isn't even close. You would be better off in a twin.

Q Can you explain why? If you would like to do so, you may go to the blackboard.

* * * *

[758] Q Before you go into the doubles, on your last diagram, can you explain what happens in the failure mode [on semis]? If the valve or the line fails, what happens to the brakes?

[759] A The brakes on the trailer go out. If you were to break the line—that connection that I just had on the blackboard—if something were to happen and it would be severed, that single valve that I just drew would turn the brakes on on the semi. That would be your emergency brake system on the semi.

Now, let me walk you through on the two doubles here. The tractor is still the same, but now what do we have? We have one axle—and these two trailers, I might add, are mechanically identical.

We have an air tank and a valve for the first trailer, an air tank and a valve for the dolly, an air tank and a valve for the second trailer. Now, if I go up here and I take this air connection and I break it, and I lose the aid for any reason, now, what do you think the odds are of the brakes going on for sure? Once, twice, three times. I suggest you only have that once on a semi, so it isn't even close.

* * * *

[760] Q If I have a valve failure on a tandem axle of a semi, do I lose braking?

A If the valve malfunctions, you certainly do. I don't know the form of the malfunction, but, yes.

Q If one valve malfunctions on the semi, I lose braking on the two axles?

A It is a 100 percent failure.

* * * *

Q Now, if I had a valve failure on a twin trailer, a single valve failure, is it possible for me to lose braking on two axles?

A No. Here is the thing. This valve that I am talking about, it is the same valve. If you have a semitrailer, you have the valve. The valve controls two axles. This axle, this and this and this are all the same, identical. The only [761] difference is that where you have one valve controlling two, you have one, two, three, because each one is a system unique unto itself. That's the difference, and that's why certainly it is more complex, for heavens sakes, if you have three valves over one valve, but to say it is unsafe is totally unreal. It is in fact two times safer if you are talking about emergencies and the ability to stop a vehicle.

* * * *

[768] Q Is there any difference in where upper couplers of semitrailers of the 40-foot vans, as opposed to the twin van units in your fleet are?

A As the equipment becomes older and older, the weight on a semi, if there is going to be an upper coupler problem, there will be one on a semi before it will ever be on a doubles trailer, because a doubles trailer generally has the same upper coupler, but never sees the weight; * * *

* * * *

[769] Q (By Mr. John Varda) Is there any difference in trailers standing fatigue and roof fatigue as between 45-foot semitrailers and the shorter twin trailer units?

A Yes, in that both trailers are really the same trailer, you know. If you just view them as the same trailer, the longer the trailer, the more the roof problem. The roof problem generally is a series of cracks with age, normally within the first few feet of the trailer, and you can visualize for yourself—as you load a semitrailer, you may not see it go down, but it in fact releases the single piece of roof skin. * * *

* * * *

Q Is there a difference in tire wear between semi-tractor equipment and twin-tractor equipment?

A On the steering axle.

* * * *

[770] Q Which vehicle has a longer life for steering axle tires?

A A doubles tractor goes longer with a set of tires on the steering axle than that of a semi.

Q The steering restraint that you referred to was a result of the tandem axles of the semi-tractor?

A Yes. Anytime you put two axles together, you automatically have an alignment problem. * * *

* * * *

Q What is "wheel hop"?

A Well, I should have probably rephrased that. If you step on the brakes and you are trying to really stop fast, wheel hop is the ability of one axle to stop and skip as the other [771] axle goes on and skips, and wheel hop is the vertical motion of two axles with the wheels locked. It is primarily found on an empty piece of equipment.

You have undoubtedly over the years heard it yourself when you see some empty truck at a stop sign that has just turned red, and he steps on the brakes, and you hear this banging motion. If you look around, you will see it is a set of dual axles.

* * * *

Q The hop situation where you refer to dual axles, is that a tandem axle?

A Yes.

Q That would be typical of semitrailer combinations?

A That's true.

Q It would not be typical of a twin-trailer combination?

A That's correct.

* * * *

[772] Q Does it take longer to get the brakes on on the semi or on the twin?

A What I was referring to, Mr. Varda, is the length of line that I read about in this report that you gave me. On a 45-foot semitrailer, if we are going to use that as a criteria, the line—in that everything on the front of the trailer is the same, it talked about timing. If the line is longer to the brake valve, which I described on the blackboard, it will obviously take longer using that reasoning than it would if the trailer is in fact only 28 feet long, to whatever that measurement is, the brakes would in fact go on faster on a set of doubles, if you are talking about the timing of brakes.

THE COURT: Would that be true of the back axle of the double?

THE WITNESS: What happens when the air goes on with the signal to turn the brakes on, as it goes, it actually goes through the first trailer into a fast brake kit—that's part of the dolly—and the air is traveling to the source of the valves [773] as it also is traveling to to the brake itself. Timing on doubles, believe me, is extremely fast.

People are misled if they think that because there are a lot of wheels and a lot of tires that, you know, it probably isn't as good. The facts don't bear that out. Timing on doubles is extremely fast.

* * * *

[778] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[786] Q So all your trailers would be specially ordered?

A All of our trailers would be by our specifications. We don't try to tell the trailer manufacturer where to put his cross members, or things of this nature, but we call out specifically by length and part number all of the air components that go into the vehicle, because of the brakes.

[787] Q (By Mr. Paff) Now, in your description on the blackboard of component failures in braking systems, I believe it was your testimony that you felt, as I understood it, that you would have more braking available to you after a failure in a twin as opposed to a semi, is that correct?

A Absolutely.

* * * *

[790] Q Are you testing your triples operation on this fuel economy business too?

A We have already done that. We know precisely how many miles per gallon we will get on the triples. Now, 1½ years later, it is exactly what we are getting on our triples.

* * * *

[799] REDIRECT EXAMINATION

BY MR. VARDA:

* * * *

[800] Q Historically, at one point in time did general commodity carriers use some truck and trailer combinations?

A Yes. That was prior to even semis.

Q What was the standard length of the trailers in truck and trailer combinations?

[801] A At Consolidated Freightways it was 28 feet.

* * * *

JAMES SCHLUETER

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. VARDA:

Q State your name for the record and spell your last [805] name.

A My name is James Schlueter, S-c-h-l-u-e-t-e-r.

* * * *

Q What position were you employed in prior to October, 1978?

A Prior to October, 1978, and for the ten-year period preceding that, I was Vice President of Transportation of Consolidated Freightways.

Q Very briefly, what is the role of the Vice President of Transportation of Consolidated Freightways?

A The Vice President of Transportation is responsible for the over-the-road operations, and the management of the movement of freight throughout the United States, Canada and Alaska.

[806] Q (By Mr. John Varda) Did you have prepared, as a portion of your direct testimony in this proceeding, a document entitled "Sworn Testimony of James A. Schlueter", identified as Exhibit 32?

A Yes, I did.

Q Is the information contained in that document true and correct, to the best of your knowledge?

A Yes, it is.

PLAINTIFFS EXHIBIT 32

Sworn Testimony of James A. Schlueter

[Admitted In Evidence by Stipulation of Counsel]

* * * *

Iowa's exclusion of standard twin by limiting the combination length to 60 rather than 65 feet, plays havoc with CF's interstate and transcontinental operation and forces CF to choose among limited alternatives, none of which is desirable or satisfactory to the public or to CF.

These alternatives, all of which are in use on a daily basis, are:

- Operating standard twins (65-foot) over circuitous routes around Iowa.
- Dividing standard 65-foot twins into single twin units at the state line for operation in Iowa.
- Operating a special fleet of 22-foot non-standard twin units, to pair with standard twin units to operate 60-foot Iowa twin combinations, in and beyond Iowa.
- Operating 55-foot tractor-trailer combinations ["semi(s)"] in lieu of standard 65-foot twins on through schedules in and beyond Iowa.

III

* * * *

As a general commodity carrier, CF transports the broadest range of freight, from air conditioners to castings, from baby bottles to toothpaste, from machine parts to typewriters, from plastic pellets to washing machines. A full listing of commodities transported by CF, consisting of some 800 pages, is contained in National Motor Freight Classification Tariff ICC-NMF 100B, which is published by the National Motor Freight Traffic Association, Inc., and filed with the Interstate Commerce Commission.

CF serves all types of shippers, including large and small manufacturers, retail merchants, hospitals, government offices, business institutions, and private residences.

CF serves every type of community from congested cities and their suburbs, to the smallest rural community.

* * * *

CF owns and operates a fleet of some 7,000 units to serve its authorized territories, including:

CF Operating Equipment
December 1, 1978

Road-Tractors		Trailing	
Twins	1551	Twins-Van	9,296
Semis	860	Twins-Open Top	200
Truck Driver	51	Iowa Twins	18
		Truck Trailer	290
		Semi-Vans (45')	2,653
Converter		Semi-Open Top (45')	122
Dollies	2,704		

* * * *

A traditional differentiation between truckload [TL] and less than truckload [LTL] has been a shipment weight of 10,000 pounds. CF's shipments in the LTL category in 1975 amounted to 98.3% in 1976, 98.0%; in 1977, 97.9%. CF's tonnage in the LTL category for 1975 amounted to 60.6%; in 1976, 57.5%; in 1977, 56.1%. The large proportion of small shipments demonstrates the basic problem and the basic goal of CF's operation.

Successful operation may be defined in various ways. In terms of CF's obligation to the public as a common carrier, successful operation is a provision of timely service at a reasonable cost. To meet this goal, CF must (1) consolidate numbers of small shipments from various origin areas, (2) dispatch vehicles over-the-road frequently, and (3) distribute shipments to the various destination territories. This service goal requires minimizing the number of handlings of each shipment, avoiding loss and damage, dispatching over-the-road trailers as full loaded as possible, and maximizing the ability of city drivers on pick-up and delivery service to route themselves and be routed over the least distance possible. * * *

* * * *

Transportation of general commodities requires a maximum ability to consolidate small shipments for over-the road movement, as expeditiously as possible. Public expectations of time-in-transit require overnight service on distances up to 300 miles, second day service between 300 and 600 miles, third day service between 600 and 1,000 miles and fourth day service over 1,000 miles. This is the standard for general service. The ability to fill up trailers for frequent dispatch over-the-road and the flexibility to combine trailers dispatched from different terminals are needs peculiar to the transportation of general commodities and small shipments. Twin trailers meet these needs. The miles operated by CF with twin trailers, over 99% in standard 65-foot combinations, dominate its general commodity operations.

Table F
CF Percentage of Miles Operated by Twin Trailers
1970-1977

Year	Semi and Twin Miles	Twin Miles	%
1970	211,795,270	134,483,991	64.0
1971	229,934,172	163,011,722	70.1
1972	253,940,620	189,095,668	74.5
1973	279,248,381	211,888,593	75.9
1974	293,413,591	234,133,413	79.8
1975	271,889,329	204,947,759	75.4
1976	300,403,515	216,994,970	72.2
1977	336,108,163	230,557,995	68.6

* * * *

Iowa, astride Interstate 80, is an island barrier on a principal route on CF's main line relay. * * *

*   *   *   *

A single twin unit can be loaded and unloaded in approximately one-half the time required for a 45-foot semi trailer. Two twin units approximately 54 lineal feet of cargo capacity, can be unloaded in the same time required for one 45-foot semi trailer. Based on average cubic capacity, loading and unloading of twins is 20% faster, per cubic foot of capacity, than loading and unloading of 45-foot semi trailers.

*   *   *   *

"Direct" loading and dispatch of trailers from origin area to destination area minimizes time consuming and costly freight handling in-transit and permits CF to maintain satisfactory and competitive time in-transit factors. * * *

*   *   *   *

From these analyses, CF establishes load plans for "direct" loads for any origin-destination pair which moves approximately 15,000 pounds per day. Such traffic is loaded on a twin unit at origin and moves "direct" to a destination area terminal without rehandling. * * * If semi trailer units, only, were utilized, the threshold factor for "direct" loading would be not less than 30,000 pounds per day for each origin-destination area pair.

*   *   *   *

Use of twins has a similar impact on the movement of empty equipment resulting from freight imbalances. The flexibility of twins compared to semis, for general freight handling, in dealing with imbalances, reduces empty equipment miles.

This procedure can be illustrated by the following example. Denver is light loading terminal. In the year ending March 31, 1978, in the Denver-Buffalo traffic lane, only 5 million pounds moved from Denver to Buffalo, while 15 million moved from Buffalo to Denver. The imbalance in this traffic lane is typical of Denver terminal operations. Empty twin units in Denver may be dispatched to St. Francis for loading or on to Kansas City or Wichita. If a single loaded twin unit were generated at Denver for Buffalo, the unit might be combined with an empty for dispatch into Kansas City. There the loaded twin might be married with a Buffalo-bound twin unit from Los Angeles, for a through movement of a twin combination to Buffalo. The empty Denver origin twin unit might be dispatched loaded from Kansas City to Los Angeles or any other point.

* * * *

Use of twins reduces freight loss and damage. Loss and damage occurs in all freight transportation. * * *

* * * *

The cardinal principle of loss and damage management in the transportation industry is that avoidance of handling avoids loss and damage. The greater the number of freight handlings, the greater the exposure to loss and damage. Significant decreases in handling will drastically reduce claims.

* * * *

Use of twins reduces intermediate and origin and destination shipment handlings.

For the purposes of this discussion, each shipment handling can be considered a "point of exposure" or an opportunity for loss or damage. The routine LTL shipment between smaller terminals may have at least eight physical handlings or points of exposure, as follows:

1. A driver loads the shipment into the pickup and delivery unit;
2. An origin terminal dockman unloads the shipment from the pickup and delivery unit to a dock cart;

3. An origin terminal dockman moves the shipment from the dock cart to the line-haul trailer;
4. A dockman at the break-bulk terminal unloads the shipment from the line-haul trailer to a dock cart;
5. A break-bulk terminal dockman moves the shipment from the dock cart to a line-haul trailer;
6. A destination terminal dockman removes the shipment from the line-haul trailer to a dock cart;
7. A destination terminal dockman loads the shipment into a pickup and delivery unit; and
8. A driver unloads the shipment, delivering to the consignee.

Since twin trailers (singly) may be used as pick-up and delivery units and, thence, as line-haul units, their use increases CF's ability and opportunity to eliminate handlings, 2, 3, 6, and 7. The use of semis, on the other hand, generally precludes avoiding any of these handlings.

A "re-ship" or "break-bulk" stage automatically adds two additional handlings. Use of twins permitting "direct" terminal-to-terminal operations minimizes the necessity for re-ship or break-bulk handlings. Use of semis substantially increases the number of re-ship or break-bulk handlings necessary to provide service between points on CF's system.

* * * *

CF performs pick-up and delivery service throughout the commercial zones and areas served by its terminals. For example, CF actually picks up and delivers freight at businesses' and merchants' locations in downtown Des Moines and on State Street in downtown Chicago. Use of line-haul equipment to perform pick-up and delivery service avoids the cost of extra cross-dock handlings and the inherent delays in loading from city vehicles to over-the-road equipment. Use of single twins units for pick-up and delivery in congested city locations is ideal, where 45-foot semis are both difficult to manuever and, in some cases, are restricted in their use.

* * * *

The handling of small shipments requires that CF respond to substantial variations in traffic flow. These variations place a premium on equipment compatibility. Ideally, CF should be able to dispatch any equipment in combination on any traffic lane, to respond to traffic demands. Equipment incompatibility delays freight and may result in added costs to adjust equipment supply to traffic demand. Adjustment of equipment supply may cause movements of empty equipment, to avoid excessive delay of the freight. CF's current operations in and through Iowa illustrate the compatibility problem.

Iowa's exclusion of 65-foot twin trailers causes CF equipment compatibility problems from (a) operation of 60-foot twin trailers and (b) operation of semis in lieu of standard twin trailers.

* * * *

CF operates the 22-foot Iowa twin units as "captured equipment." The units are operated only between Iowa terminals and the next nearest terminal on CF's route, which include terminals at Omaha, Kansas City, Rock Island, and Aurora. At these terminals, the Iowa twin units emptied and returned on dispatch to the Iowa terminals. In mid 1978, CF operated some 23 Iowa units, principally between Kansas City and CF's Iowa terminals at Cedar Rapids and Waterloo.

The reason for capturing and returning the equipment to Iowa at the next nearest terminal is that to operate it beyond on CF's system would add to the cost and compatibility problems. For example, if an Iowa twin unit were loaded at Cedar Rapids for San Francisco and loaded to San Fransciso, CF would incur many added miles of line-haul operation of a 60- rather than a 65-foot combination, in states which do not restrict twins to the 60-foot length.

The more significant problem, however, is that CF would have an empty Iowa twin unit in San Francisco. * * *

* * * *

These problems with the operation of 60-foot Iowa twin trailers have led me to direct the retirement of the Iowa twin units in favor of increased use of semis and shuttle operations to serve CF's Iowa traffic, as the less burdensome alternative for coping with the Iowa length limitation.

b. *Equipment Incompatibility—Operation of Additional Semis*:

Single axle tractors are used in single twin unit operations and in both 60- and 65-foot twin combinations. Tandem axle tractors are used in semis.

The Iowa length limitation on twin trailer combinations results in CF's operating semis in certain traffic lanes in lieu of twin trailers.

The variation in equipment limits CF's flexibility in dispatching over-the-road schedules. For example, if fluctuations in traffic dictate a decrease in the number of schedules operating between Minneapolis and Dallas or Minneapolis and Kansas City, the power equipment used on the Minneapolis-Dallas or Minneapolis-Kansas City routes cannot be used on schedules dispatched between Minneapolis and Portland or between Minneapolis and Milwaukee or Chicago. The former routes are operated with semis due to the Iowa restriction; the latter routes are operated with standard twins. The exclusion of standard twins on interstate highways in Iowa is, of course, the sole reason for using only semis on the Minneapolis-Kansas City and Minneapolis-Dallas routes.

* * * * *

This type of incompatibility could be illustrated with many more specific examples. * * *

* * * *

CF has addressed the problem of providing service to and from Iowa and on freight which would otherwise move through Iowa from the standpoint of both service and cost factors. CF's cost of service does not dictate all operational practices. Service required by the shipping public, such as overnight or other "guaranteed" time-in-transit, may occasion operations which are not the most efficient in terms of cost. CF's management closely monitors cost and service requirements on a continuing basis. Its current operations to, from, through, and around Iowa reflect these complex judgments.

* * * *

For freight moving between eastern and east central areas, on the one hand, and Colorado, Wyoming, Utah, Idaho and northern California, on the other, standard twin trailers in CF's mainline relay operations, are routes via Cameron, Missouri, and North Platte, Nebraska. The most direct routing of this, east-west transcontinental freight would be over interstate highways in Iowa.

* * * *

For freight moving to and from Iowa, CF will divide standard twin combinations to operate as single twin units on highways in Iowa, in a shuttle service between CF's Iowa terminals and Iowa boundaries, or as close to the boundaries as feasible. Outside of Iowa, the units are operated in standard 65-foot twin combinations.

* * * *

Where shuttling of single standard twin units is not practical due to distance or other factors, CF has dispatched "mixed doubles" units in combinations of approximately 60 feet. This 60-foot Iowa twin combination consists of the same type of tractor used in standard twin trailers, a standard twin trailer unit, and a short trailer, of approximately 22 feet in length. The 60-foot combination may be referred to as an "Iowa twin trailer"; and the 22-foot trailer as an "Iowa twin unit."

CF owns 23 Iowa twin units. These are known within the company as "41 series" trailers. CF operates the minimum necessary to accommodate its current operation of 60-foot Iowa twin combinations. Currently, a few shorter "truck-trailer" units are being used. Due to equipment incompability, ownership costs, and freight handling problems, these units are being gradually retried. CF will cease operation of 60-foot Iowa twin combinations, in favor of shuttling single standard twin units.

* * * *

In coping with the Iowa ban, CF uses the most cost- and service-efficient alternative for each situation. In addition to dividing standard twin trailer combinations at Iowa's borders and operating 60-foot Iowa twin combinations, in many instances, good operational judgment requires that semis be used for an entire schedule both into and through Iowa. In other words, Iowa's ban on standard twins forces CF to operate semis on highways in other states where standard twin combinations are permitted, as well as on highways in Iowa. This is particularly true, for example, for freight moving between terminals in Minnesota, North Dakota, and at Winnipeg, Canada, on the one hand, and CF's Missouri, Oklahoma, Texas, Arizona, and southern California terminals, on the other hand. All of this freight must traverse Iowa. The operations are addressed by Mr. Wrightson in his "Item C-2" and "Item C-3."

* * * *

DIRECT EXAMINATION CONTINUED

BY MR. VARDA:

* * * *

[816] Q What percentage of your transcontinental traffic would move on these three routes?

A Oh, I would say about 90 percent, 92 percent, probably, somewhere in that area.

Q Is one of the routes more heavily traveled than the others?

A The green route shown on the may, which we refer to as our central route, is the heaviest of the two routes.

Q Is that the route affected by exclusion of 65-foot twin trailers from Iowa?

A Absolutely.

* * * *

[817] Q Can you give me for the northern route the approximation of semis and twins on that route?

A On the red [northern] route shown on the map, on a current basis that's operating about 80 percent doubles equipment, and about 20 percent semi equipment.

Q What about the central route?

A About the same.

Q And the southern route?

A That runs a little more to the—about 65 percent doubles, and about 35 percent semis.

* * * *

[820] Q In your testimony, sir, the sworn testimony, at Page 14 you make a remark, if I can just read it to you to refresh your memory, "CF operates in territories affected by all types of weather using both semis and twins, although twins are operated more miles under adverse conditions."

Can you please explain—and use the maps in your explanation, if you would—how it is that twins operate under more adverse weather conditions and what you mean by "more adverse weather conditions"?

A Well, the reason that I state that particular point is that as you may be aware, the country is relatively flat up until you get about through to Denver and to the Cheyene area. From that point on we operate in Montana, Wyoming, Idaho, Oregon, Washington, Nevada, California, Arizona, in relatively high mountain pass areas. I think our largest mountain pass that we cross is 8,600 feet.

For example, in the Montana area—and it would be true everywhere—mountain passes are covered with snow for at least six months of the year. They are steep. The terrain is difficult.

We have more road closures in this part of the country, [821] in fact. To give you a little example, in the State of Wyoming, I think we had 34 road closures on the interstate in the first two months of 1979. There are extremely difficult driving conditions. That's one of the reasons that you will note Consolidated Freightways' trucks have chains on them as a regular part of their complement; whereas, that is not true with a lot of carriers that do not operate in the mountain areas.

As a general rule, we feel, from our observation and our experience, that the doubles simply operate in a territory that the semi would not operate to the degree in as much adverse weather.

Q The twins predominate in that type of adverse weather conditions in terms of the miles of operation?

A In terms of the miles of operation.

* * * *

Q Would twins predominate in the Plains States in the north?

A Yes.

Q Would twins predominate in the central states in the North, such as Michigan, Indiana, Idaho, and so on?

A Twins would predominate—would be the predominant equipment in Ohio, Illinois, Indiana, Wisconsin.

[822] Q Would that be true also of the northern New England states where you show the green operations on your map?

A Basically in the New York area and the upper New England area, that would probably be 80 percent doubles operation.

* * * *

[840] Q Does compatibility of the equipment types affect whether you obtain a maximum use of the equipment?

A Absolutely. Our No. 1 operating problem in Consolidated Freightways today is the incompatibility of equipment.

Q Are twins and semis compatible?

A No.

Q Can you explain in what way they are not compatible? Perhaps if you need to, give some examples which will illustrate.

A Well, a piece of semi equipment, of course, is a tandem axle power unit, and it cannot be hooked under a set of doubles, so that if you have—for example, if you have a terminal where there happens to be three tandem axle tractors and no single axle tractors and you have no sets of doubles to go someplace, you don't have the right equipment to marry with the trailers, so the trailers are going to sit, and the tractors are going to sit, and at the same time both of them are good viable pieces of equipment that ought to be moving.

You can, on occasion, put a single axle tractor—a doubles tractor underneath a semi for a short period of time, but then you have to redo the balance and get the trailers back to where they belong, and it gets to be a very complicated process.

[844] Q Can you explain what the physical process of interlining a shipment is?

A It is similar to a break-bulk situation. It is where a motor carrier picks up a shipment in a small town, or anyplace, and takes it to the interchange point or the connecting point of the two carriers and simply takes that shipment over to the other motor carrier. It is unloaded from the trailer, crosses his dock, and then it is loaded onto somebody else's trailer.

Q Can you distinguish the situation where there is an interchange of equipment in connection with an interline movement?

A Interchange of equipment is where, rather than rehandling the traffic, you leave the traffic on whosever trailer the equipment happened to be on at origin, and the equipment then goes all the way through to the destination.

[845] Q Is there some desirability in moving the equipment through to the destination?

A It improves the service and avoids the rehandling, lessens the chance of claims.

Q What do you mean by "claims"?

A It lessens the chance of the freight being damaged by handling.

Q Do you normally have some equipment of other carriers on your system as a part of interchanges on a daily to weekly basis?

A We normally have other carriers' equipment on our line on a regular basis; however, it is our corporate policy that we prefer to provide our equipment to the interchange carrier, because we feel our equipment is better for our operation.

Q Approximately how much interchange equipment would you receive on a given day, if you can give an estimate?

A If I were to take a snapshot of the operation today, there are probably 30 to 60 pieces of equipment out of line, somewhere in that area.

Q Approximately how much of your company's equipment would be off-line with other carriers?

A I would have probably 300 trailers a day in some kind of off-line status.

Q What type of carrier would you generally be—would a transcontinental carrier generally interchange with?

[846] A The shorthaul carrier making the point that we don't service.

Q Would that be more typical than an interchange system with a transcontinental carrier such as Roadway or Pacific Intermountain Express, or somebody like that?

A I would say they would all be about typical.

Q Is interchange generally conducted with the shorthaul distribution carriers?

A I would say normally, but it is not always, but I would say in our company, on a normal course of business, we are doing it with shorthaul carriers.

Q Would shorthaul carriers predominate in the interchange and interline situation?

A Yes.

Q Do shorthaul carriers accept twin trailing units for interchange?

A Yes, they do.

Q Would more twin-trailer units than semitrailer units tend to be interchanged?

A Well, in our company, because the majority of our equipment is doubles, it is the case. It depends upon the part of the country.

Q Is it easier, for example, in the West to interchange a twin-trailer rather than a semitrailer?

A Oh yes. Almost all your shorthaul carriers in the [847] West are doubles operators.

Q Why would they not want a semitrailer unit?

A They won't have a tandem tractor to pull it.

* * * *

[849] Q (By Mr. John Varda) Do your drivers get to select whether they operate a twin or semi?

A No.

* * * *

Q Is there any ability to select twin or semi in that situation?

A No. They are just going to take the load as it comes out.

* * * *

[850] Q Can you give us the fleet aging—in other words, the average age of your equipment as of January 1, 1978, for your twin power equipment?

A Twin tractors on January 1, 1978—I just abstracted this off one of my records—was 33.8 months. That's normally consistent with our operation.

Q How about the semi power equipment?

A It was 32.7 months. We turn our tractors in five years, so that's about where it ought to be.

Q How about your twin trailer trailing equipment?

A Our average twin trailer equipment had been in service 60.4 months.

Q And your semitrailer equipment?

A 22.5 months.

Q There is a considerable difference there?

A Well, for a couple of reasons. One is that our doubles trailers last longer, I believe as Mr. Markland had testified, and it's true in our normal operation that there is not quite [851] the stress on double trailers, so we keep those a little longer. We normally turn our semitrailers a little sooner out of the fleet than we do doubles; however, not to the proportion of the numbers that I indicated to you.

Part of that is the reason that our growth in the last couple of years has been in the pink area, and we have bought more new semis in the fleet, so the fleet is a little out of proportion with more new equipment in that specialized operation. Normally that number should probably be around 35 or 36 months.

* * * *

[925] Q Are the difficulties which you describe as arising out of the Iowa ban of 65-foot twin trailers any different in nature or character than the operating problems arising out of the ban of 65-foot twin trailers in the semi territory?

A Well, I think the map shown on our exhibit, the mainline relay map, really depicts, I think, the essential problem. The State of Iowa sits right in the middle of a whole group of 65-foot states, and it really causes an impediment since the interstate flows through the State of Iowa.

The 55-foot states tend to be contiguous upon them—selves and really do not affect the mainline relay operations that operate east and west and north and south, so while these are of a concern because any kind of incompatibility is a concern, the Iowa one, because it is an island unto itself, simply presents a bit more problem to us.

Q Now, you described Iowa as blocking your central [926] mainline relay. Does any one of the states or any group of the states which are designed "semi territory" affect as much traffic as is affected by having to deviate around Iowa with your central mainline relay?

A No.

* * * *

[929] CROSS EXAMINATION

BY MR. PAFF:

* * * *

[932] Q So the twin number of miles operated in twin trailer combinations has been decreasing, is that correct?

A The miles operated on twin trailers have been increasing each year. They have been decreasing in relation to the percentage of the total miles operated.

* * * *

[933] Q You attribute that in part to the movement of your company into the southeast?

A That is correct.

Q The movement into what's been called semi territory increased the equipment incompatibility problems that you described?

A Yes, it did.

* * * *

[934] Q Is Roadway a direct competitor of yours?

A Roadway is a direct competitor of ours.

Q Do they operate a relay system?

A They operate a relay system.

Q Do they use any 65-foot double bottoms in their relay system?

A They use no 65-foot equipment.

Q What is their standard vehicle, work horse on the relay system?

A Fifty-five-foot combination, 45-foot trailer and tandem tractor.

Q Did you read Mr. Jones' comments with regard to what creates this industry standard that we have talked about?

[935] A I don't recall that particular comment.

Q What determines what the industry standard is, in your opinion?

A In my opinion, what determines the industry standard is the territory that you operate in. Roadway, for years and years, up until 1977, operated the majority of their operations in what would be considered semi territory. In fact, until 1972 they didn't even have 45-foot trailers, but they operated in basically a semi territory, and felt that their operation as they have it depicted is best suited to handle that freight on semi equipment.

When we talk about industry standard, we are talking about transcontinental general commodity carriers. I do believe Mr. Jones made a comment that he would like to have twin trailers.

Q So as I'm understanding this, you would make the distinction that Consolidated Freightways grew up in the West and moved to the East?

A That's a fair assumption.

Q And that you use 65-foot doubles because of the place of your origin?

A Because of the fact that we—I would say that the right way—that I would say that would be the fact that if you look at our map, there is a tremendous long distance going from the West to the East to the Midwest. There is relatively a short [936] distance going from, say, the South to the industrial North, and I think that those long distances created the evolution of the 65-foot doubles.

I don't think that the motor carriers create this. I think it was simply evolution as a result of distance. That's my personal opinion.

Q Are you operating triple trailers in the western states?

A We have a small triple trailer operation.

Q And you describe that as small. In which particular states are you allowed to operate in?

A We operate triple trailers in the State of Oregon under an emergency order granted by the governor in 1973 as a fuel economy measure. We operate triple trailers in Idaho, Utah and Nevada. They represent somewhere less than one percent of our total miles.

Q You told me less than two percent on February 15. Would that be roughly the same thing?

A It would be roughly around the same, one or two percent. I could check the figures, but they are somewhere in that area.

Q Is that two percent of your revenue, or two percent of your freight?

A Two percent of total miles. I can't tell you how much freight they haul. We don't keep those kinds of statistics.

[937] Q You operate triple trailers on the Kansas Turnpike?

A We have a small operation. I think it's running about eight or nine thousand miles a month. We have triple trailers to haul traffic from—that operation is basically to haul freight into Wichita, Kansas, and what we normally do is just pack a Wichita trailer on back of a schedule en route to Arizona or Los Angeles, and drop it off in Wichita.

* * * *

[938] Q Now, has the volume of traffic in Iowa been increasing in the last few years?

A Our business is up. I would assume so. I don't have any specific numbers. I would imagine that the
Q Have you acquired and sought authority in Iowa
freight has increased.
since 1975?

A Yes.

Q I assume coupled with your condition that you set up your mainline relay operation in 1971, you were aware of the Iowa lengths limitation statute at that particular point?

[939] A That is correct. We set the operation up on the basis that we could either run through Iowa or around Iowa.

Q Was the relay set up at that time with the same notion in mind with regard to Wisconsin?

A Yes. We were running around Wisconsin at the time, too.

Q Have the profits that CF has made continued to rise in Iowa despite the length limitation statute?

A Well, our profit—we keep profitability figures by terminal. I would have to check those to see if it has. I can't answer that question. I don't know.

* * * *

[946] Q Now, was there one particular purchase of authority within the last two years that would be pertinent to the Iowa traffic that we are dealing with today?

A I don't recall the exact years, but we purchased a portion of the Ringsby Trucklines' authority, which gave us a direct route between—a direct mainline route between Minneapolis and Kansas City. We had previously attemped to get that authority for about an eight-year period through other means, and simply couldn't, so we bought that authority. It also gave us authority into Omaha at the same time.

* * * *

Q Now, prior to the acquisition of the Ringsby [947] authority and directing your attention to the Minneapolis group traffic, how was that traffic running on the CF relay system prior to the acquisition of Ringsby?

A The Los Angeles, Arizona and Denver traffic would have been running over our northern transcontinental route through Billings and Butte and down to Salt Lake. The Texas traffic would have been operating around Iowa by going to Illinois and then down into Texas.

* * * *

Q Thank you. Now, prior to that, did that traffic include both semis and twin trailers?

A That traffic included—That traffic would have been semi traffic up until the lifting the Wisconsin ban, and then it would have been doubles traffic.

Q So to go from Minneapolis to Kansas City prior to [948] 1977, we will say, when you acquired Ringsby, you ran semis from Minneapolis to Peru—excuse me—Aurora at that time, to Kansas City?

A That is correct. Since we were so circuitous, we simply were not in that market. There were other carriers that could go direct. We really didn't have any traffic.

Q So now you don't have any traffic generated out of Minneapolis prior to 1977?

A That would operate to Kansas City?

Q Right.

A We have a little. It just was not in our scheme of things because of the circuity.

Q So when you weren't "in the market", you ran those semis additional miles around Iowa to maintain the integrity of the relay system?

A That's a fair statement.

Q Now, I say that because you could have run semis from Minneapolis to Kansas City on Interstate 35.

A We didn't have any authority on Interstate 35.

Q With regard to the authority on Interstate 35, how does the trucking industry gain access to the interstate highways?

A As a regulated common carrier, we are authorized to serve specified communities over existing or over specified routes. The ICC determines the highways that we can operate [949] on. I believe that if you look at our operating certificate, which is a book that is fairly thick, it designates all the highways that we are allowed to operate on.

* * * *

Q But you would send the semi—You didn't have one semi on that route?

A We would not have operated over that route because [950] we didn't have authority on it. We did not have authority to run between Minneapolis and Kansas City on Interstate 35.

Q Now, with regard to the current movement of Minneapolis group traffic, could you describe the current movement, after the acquisition of authority, of Minneapolis traffic to Kansas City and points west?

A After the acquisition of the Ringsby authority—or as the Ringsby authority was in the acquiring state, we, as we do with any operation, analyzed our traffic and made a determination as to what traffic we could possibly put on the Ringsby authority. The Ringsby authority was basically purchased in order to give us a market that we felt we had between the Minneapolis group and the Texas group.

After looking at the significant mileage savings—I think it was 150 to 200. I don't remember the exact numbers—between Minneapolis and Los Angeles and Arizona and Denver, even though we did not like to operate semis and even though we created an additional incompatibility problem, we felt that that was an appropriate way to go at that time, recognizing we were going to create some operation problems, so we did take equipment out of existing doubles operations and place them into existing semi operations.

One of the reasons we did that, in addition to the short miles, was that we have a fairly well balanced operation between Los Angeles, on the one hand, and Minneapolis, on the [951] other hand, in both directions. We felt that we could possibly cope with the incompatibility problem a little easier in that leg than some of our other legs, and that was our management decision at that time.

Q So could you describe the route you would send a semi on, referring to Exhibit 34, from Minneapolis to Los Angeles, using those towns?

A Okay. We would operate the relay from Minneapolis direct to Kansas City. I believe that's Interstate 35. Then we would operate west of Kansas City to Liberal, Kansas on the turnpike and U.S. 54, and then we would operate from Liberal to Albuquerque, then we would pick the interstate up somewhere along there, and then from Albuquerque to Ash Fork, Arizona, and from Ash Fork on into Los Angeles. That would be the basic route.

* * * *

[953] Q Would you describe to us how you would move a shipment from Boston to Los Angeles, and what type of equipment would be involved?

A It would be a straight doubles operation, and the trailer would come from Boston to the Massachusetts and New York freeways. It would operate in doubles combination to the Pennsylvania line. It would be shuttled across the 50 miles of Pennsylvania, and broken apart. You can't run both trailers together.

It would be reconnected at the Ohio line, and it would run in a pure doubles combination from Akron to Indianapolis to Kansas City, and across the normal relay.

* * * *

[954] Q Now, if we did the same thing from an eastern port, say Washington or Philadelphia, how would you move it, and what type of equipment would you use?

A What would happen currently in the Washington or the Philadelphia area is we have a tremendous number of terminals in the area, and we have a large terminal at York, Pennsylvania. We would operate that in the semi equipment across the country.

Q Now, with regard to those trips starting in York, Pennsylvania, is what you're telling us, a fair assessment of that, that due to the nature of where you are starting, that determines the type of equipment that you use in that particular run?

A I would say that where I'm starting would dictate that; also how much traffic I have got, what I have to give in the way of service. I think just where I start is not necessarily the criteria, but that is one of them.

* * * *

[958] THE COURT: Let me ask the defendants a question. I am not familiar with what your evidence is going to be. Are the defendants and intervenors seriously contesting this is not [959] a burden on interstate commerce?

MR. PAFF: Your Honor, I think that the evidence will show that with regard to the asserted burden, the main purpose is that it's a question of choice on behalf of Consolidated Freightways with regard to what type of equipment they are going to operate. I think we have shown that they can operate—that as a system, it can be operated for general commodity haulers, that is, a 55-foot semi system.

THE COURT: Does that mean it's not a burden on interstate commerce, just because they would have that choice?

MR. PAFF: The question is what is the magnitude of that burden, and also the question is is it a permissible burden with regard to the length limitation.

THE COURT: Your answer is, yes, you are contesting whether or not it's a substantial burden on interstate commerce.

* * * *

Q Now, if we go to Page 24 of your statement, in the first paragraph there you talk about the exclusion of standard twin trailers, which has negated the ability to use alternate routes during winter months. Do you see that, sir?

A Yes.

[961] Q How much traffic do you anticipate your company would generate on Interstate 80 between Davenport and Omaha?

A Is that all Interstate 80?

Q Yes, sir.

A That's right. Davenport is at the east end of the state. I believe it's in my testimony. We recently checked the records again, and I would say that our numbers are pretty accurate. My feeling would be somewhere between 15 and 20 schedules each way, each day. It might be up some days, down other days. It could go to a low of five, and half of 30, 15 or 20 would be a reasonable number.

* * * *

[962] Q How many on interstate running from Minneapolis to Kansas City?

A Three or four. There, it would be less than we are running now because we are running semis now, and if we put the freight in doubles, we would run less schedules.

* * * *

[966] Q What is your company policy as it relates to the operation of semis and/or double-bottoms?

A It has been our generally accepted policy that we have been a doubles carrier. We would prefer to operate doubles, but we operate semis because we have been getting more into [967] semi states, but we would prefer to operate doubles, but we will operate any combination that is legal.

Q But these are management decisions, are they not?

A Well, management decisions, yes.

Q Is it your company policy to make money?

A That's why we are in business, is to make money.

Q In order to arrive at that end, have you not set certain optimums for your operation?

A Yes, we have certain objectives.

Q For instance, in the area of equipment, your optimum is the 65-foot double-bottom?

A We would like to operate 65-foot doubles, that is correct.

Q In this same area, is it your posture to operate in every state so as to take advantage of the maximum allowable length and weight?

A It is our posture to take advantage of the maximum optimum size and weight where we can best service our customer.

For example, if we were to operate a load from Charlotte, North Carolina to Seattle, Washington, we obviously can't take advantage of the optimum length and weight through the states that we pass through if we elect to operate a piece of semi equipment all through that area.

Q That's within the practical limitations of the fact that you have to load a 55-foot at the point of origin, is that [968] correct?

A That's correct; that is correct.

Q As far as your optimum as far as distance traveled is concerned, do you attempt to operate the shortest route?

A Yes.

Q Perhaps the shortest route between your relay points?

A We try, where practical. As I said before, I think in my previous testimony, we do prefer to operate on four-lane highways, and where there might be some minor deviation from the absolute truest direct route, we would operate on the four-lane highway.

* * * *

[972] Q (By Mr. Bittner) Now, I believe you stated in that respect that among your other policy considerations is that without regard particularly in this instance to the 65-foot semi, you go where the market is, is that correct?

A I would say so.

Q Was there consideration given to the prospective use of double bottoms, 65-foot double bottoms, when you went into the Southeast market?

A No. When we went into the particular market I just mentioned, it was under the premise that we would operate the entire segment in 55-foot equipment.

Q Then is your answer given in your deposition at Page 93 incorrect? You were asked, "Mr. Schlueter, I guess I have a couple of other questions. How do you view it as a corporate policy to expanding the territory where you can't operate twins". And your answer was, "Because of the market potential in the areas where we cannot operate twins, it is obviously our posture and has been our posture in the last couple of years that we would prefer to be in a market under the assumption that some day we will be able to get twins".

Were you incorrect at that time, or are you incorrect today?

A I don't see any inconsistency in the two statements. We still, to this day, would hope that we would get twins in that area. If I made a statement there that said we don't [973] intend to go into the market unless we can operate twins, that is obviously incorrect.

We get into a market that we feel is profitable; we obviously would like to operate twins in 48 states.

Q Do you regard states that restrict you in that respect as being unreasonable?

A I personally feel that—from a personal operating standpoint, from my personal opinion, I feel that the country would best served if there was a uniformity in sizes and weights for the transportation of truck load commodities, of truckline type traffic.

* * * *

[974] Q (By Mr. Bittner) As a result of the lawsuit which was instituted in Wisconsin, and the resultant unconstitutionality of their regulations, has Consolidated Freightways been able to generate a cost effectiveness?
[975] A Yes.

Q To what extent?

A At the time that we initiated the operation, our feel at that time was that would be cost effective to the tune of about a reduction of $6,600 a day in expenses. As I recall, although I haven't looked at the figures of late, we have exceeded that. We have even exceeded what we thought we were going to save.

Q Does that reflect on profitability?

A Yes, sir.

Q What have you projected, as far as cost savings in the State of Iowa, were our 60-foot twin bottom regulation to be held invalid?

A I would say, if I recall the numbers that have been marked up, somewhere in the neighborhood of two million dollars, and obviously that will increase as we get—as our expenses go up. We are looking in the neighborhood of an annual savings of about two million dollars, something fairly close to the Wisconsin savings.

Q Have you projected a similar cost savings were you to attempt the same thing in Pennsylvania?

A We haven't started to do any in depth analysis through Mr. Wrightson and the accounting people, that I am aware of. They may be working on some studies, but I suspect if there are some around, he would know about them.

[976] Q How about in any other states, that you are aware of?

A No, I don't know of any; but, as I say, I have been away from my last job since October, so there could be things going on I am not aware of.

Q Having made this cost effective determination before and on behalf of Consolidated, have you made any similar type cost effective determination as it relates to the cost to Iowa citizens in terms of added exposure, added miles, cost and maintenance repair, and items of that nature?

A No.

* * * *

[981] Q Does the 1977 map reflect various terminal locations of Roadway Express?

A Yes, it does.

Q With respect to the terminal locations in the Northeast and Southeast, on the one hand, and those in the Midwest territory, on the other hand, can you make any observations with respect to the type of operations you would expect by that company?

A Roadway, as I understand it—and we do keep fairly close track of our competition—the majority of their operation, the main thrust of their operation runs from the north to the south and from the south to the central or, as you can see, the Michigan—they are very heavy in automotive traffic.

Q Would that entail a substantial part of that operation as either originating or terminating in the semi territory as reflected on your Exhibit 34?

A Yes. The majority of their traffic would operate in [932] that area, and it would also be a very balanced lane too.

MR. JOHN VARDA: I will just note for the record, Your Honor, the corresponding testimony by Mr. Jones is at Page 16 of his deposition.

Q (By Mr. John Varda) Could you turn over in that Exhibit 1 and see if you find a mainline relay map?

A Two more pages down? Yes, they have a map entitled the "Relay System".

Q Is there a portion of that relay system which is now a transcontinental route?

A Yes, the southern portion to Los Angeles.

Q Was that the former Western Gillette authority?

A Yes, from Oklahoma City west.

Q Did Roadway Express only recently obtain that authority?

A Yes. In 1977, I believe.

Q Can you make any observation concerning the operation of that relay to the Los Angeles area and the operation of your relays in that territory with respect to a balance of operation problem?

A Roadway's posture—their market strategy, as I understand it, and their management philosophy has been to try to operate in very balanced areas, and the Los Angeles area, because it is the largest manufacturing area on the West Coast, tends to place their operation in a more favorable operation with regard to balance. [983] You will notice, for example, their operation does not operate in half of the country geographically. If you take the territory and the distances, say, north of Albuquerque all the way to the Canadian border, they don't operate in that particular territory, and in conversations I have had in the past, I would have to perceive it is because it is a very tough place to operate with regard to balance and with regard to weather.

* * * *

Q Has Roadway typically been considered, over the years, to be a transcontinental common carrier?

A I would construe them to be a regional carrier.

Q Can you name some of the transcontinental general commodity common carriers?

A Yellow Freight Systems, Trans Con Lines, Pacific Intermountain Express, IML, Time, D.C. Arkansas Best is now a transcontinental carrier, having bought out Navajo. There are probably 15 or 20. Garrett Freightlines.

Q What is the general posture of the carriers you have just named with respect to the operation of twins as opposed to semis?

[984] A If I remember the numbers offhand, those carriers operate anywhere from 50 to 80 percent of their operations in twins.

* * * *

Q (By Mr. Paff) So if I picked up the phone and called Roadway and wanted my LTL shipment moved from Des Moines or Ames, could I get service today transcontinentally from them?

A You could get service to all the points that they show on this map, which would be California on the West and Maine on the East.

Q If they could not serve me, would you interchange or interline shipments with Roadway?

A Because we are so competitive in nature, the two of us normally don't interchange with each other.

[985] Q Would that shipment move from Des Moines or Ames in a 55-foot semi the entire way?

A In Roadway's operation, yes.

* * * *

Q When did you begin your initial operation of doubles in the West?

A Oh, it had to be in the late '50's, as I recall. We were running truck and trailer, and then we were running semis. Doubles started, I think—I was trying to remember if it was when California went doubles or not at the time. I don't recall. It had to be around '59 or '60. It has been in evolution since that point. There were a lot more states that didn't allow doubles in those days, so obviously it wasn't a total operation.

When California went to doubles, was that 60-foot doubles or 65-foot doubles?

A 65, to the best of my knowledge. I don't recall any 60-foot doubles.

* * * *

[987] Q Now, when do you determine to run 400 miles empty with a piece of doubles equipment to serve a particular company? I believe that was your testimony.

A It would be depending upon the kind of traffic it was and the service requirements, what the balance was at that particular time. There are a tremendous number of factors involved in when we elect to dedicate an empty for something.

Q Do you have situations where the reverse is true about semis, where you need semis on the West Coast to move special shipments from, say, the West into the pink states?

A Yes.

Q Do you remember describing such an example to me when we talked before about this matter in February?

A I recall. The example I used, and I may have used it then, I suppose, was the Panasonic move.

Q Yes, sir.

A That's the typical one. That's about the only big one that we have on a repetitive basis.

[988] Q So we can understand that, what was it?

A Panasonic purchases all of their televisions, stereos and radios from overseas in the Far East. They come through the Port of Seattle. This very high-value cargo is mostly destined to the New Jersey, New York area. We don't want to transfer this traffic or damage it. We prefer to run it straight through, so in those instances, because New Jersey and New York are semi states, we will force a semi westbound, even though it is fairly costly, to support that customer so that the freight can ride on the same trailer it is loaded on through to the destination.

Q So you are changing your equipment balance to reflect the customers' needs?

A Unfortunately, that is so.

* * * *

Q What equipment would that traffic run in if semis were not excluded—if twins were not excluded in the Eastern destination area in the traffic?

A We would run right straight through on doubles.

* * * *

[990] ROBERT E. WRIGHTSON

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JOHN VARDA:

* * * *

[992] Q Do you have before you a copy of a document which has been marked for identification as Exhibit 46?

A Correct.

Q Is that your sworn testimony in this proceeding?

A Yes, it is.

Q When was the basic document prepared?

A The basic document was prepared, I would say, in the time period of March through—well, no, I will back up. The basic document was prepared in the fall of 1977—'78. I would say it was essentially finalized in January, February of this year.

Q Is the information in that document true and correct to the best of your knowledge?

[993] A Yes, it is.

* * * *

PLAINTIFFS EXHIBIT NUMBER 46

Sworn Testimony of Robert E. Wrightson

[Admitted into Evidence by Stipulation of Counsel]

[Caption Omitted in Printing]

My name is Robert E. Wrightson. My business address is 175 Linfield Drive, Menlo Park, California 94025. I am Assistant Controller for Consolidated Freightways Corporation of Delaware [CF] and have held this position since December, 1976.

* * * *

My purpose is to quantify the added miles and the added costs associated with Iowa's exclusion of standard twins from interstate highways in Iowa. I have limited my effort to those items which are subject to quantification from existing CF records, with minimal special study. The burden of added miles and added costs, as I have calculated it, is solely that which would be eliminated by the relief CF seeks in this litigation.

There are other aspects of the burden of Iowa's exclusion of standard twins which are not readily subject to quantification. I have not addressed the burden of equipment incompatibilities or aggravation of equipment incompatibility throughout CF's system. I have not evaluated added managerial and supervisory time required for evaluating and conducting the variety of operations necessary to cope with Iowa's exclusion. I have not attempted to quantify the burden of added exposure of CF's freight to loss, damage, and pilferage or the added exposure to vehicular accidents from the added miles of operation.

The calculations are separated into three distinct items relating to (A) Transcontinental (East-West), (B) Iowa Terminal, and (C) Minneapolis Group Traffic. Each item involves identification of added miles and associated costs. Item B, Iowa Terminal, and Item C, Minneapolis

Group Traffic, are broken into sub-items, covering specific traffic lanes or aspects of the operations. Each of the three items has associated with it a calculation of "Added Equipment" which reflects the added depreciation, licensing, and interest costs for the operations identified in each item. The burden is summarized as follows:

Table 1

Mileage and Cost Burden
Exclusion of Standard Twins
from Interstate Highways in Iowa

	Added Miles of Operation		Dollar
	One Way	Relay	Burden
Item A—Transcontinental			
Added Miles	896,104	1,792,208	$1,077,644
Added Equipment			165,232
Item B—Iowa Terminal Traffic			
Added Miles and Handling	51,641	190,010	121,410
Added Equipment			18,052
Item C—Minneapolis Group Traffic			
Added Miles and Handling	532,967	1,065,934	540,270
Added Equipment			81,525
Total Burden	1,480,712	3,048,152	$2,004,133

* * * *

5. TRANSCONTINENTAL TRAFFIC [ITEM A].

* * * *

CF's operating records are not designed to produce the specific data needed to calculate the added miles and the added cost. CF does not have readily available, for annual periods, records of vehicular trips from which added miles resulting from exclusion from interstate highways in Iowa can be calculated. I have calculated the added mileage and added cost in the following steps:

Step 1: Isolated group-to-group tonnage in the head-haul direction, affected by the Iowa exclusion.

Step 2: Developed the average weight per trailer in the head-haul direction for twins and semis, separately, for the affected group-to-group movements.

Step 3: Calculated the ratio of twin to semi loadings in the head-haul direction.

Step 4: Determined the number of trailers required to haul the over-all group-to-group tonnage.

Step 5: Developed the added miles per single trip for the group-to-group movements, in the relay around Iowa.

Step 6: Carried through the calculation of the total added vehicular miles.

Step 7: Multiplied total added miles by line-haul variable cost per mile.

* * * *

IOWA TERMINAL TRAFFIC [ITEM B].

This portion of my analysis focuses on the burden of exclusion of standard twins from interstate highways in Iowa, as it affects CF's interstate traffic originating and terminating in Iowa and certain interstate traffic moving to and from CF's Rock Island, Illinois, terminal which serves a number of contiguous Iowa points. I have provided a separate calculation of the burden on interstate traffic moving to and from Minnesota group terminals, which follows under Item C. * * *

* * * *

I have identified five (5) areas in which the burden for potential savings can be quantified. They include:

- Burden of the lesser capacity of Iowa twins compared to standard twins. [Item B-1]
- Burden of shuttle movements of standard twin units to and from Iowa terminals. [Item B-2]
- Burden of added vehicular miles between CF's Rock Island and Kansas City terminals. [Item B-3]
- Burden of rehandling Iowa freight at Aurora. [Item B-4]

* * * *

Table 2

Mileage and Cost Burden Detail
Iowa Terminal Traffic

Item	Burden Element	Added Miles of Operation One-Way	Added Miles of Operation Relay	Dollar Burden
B-1	Use of Iowa Twins	42,716	85,432	$ 51,736
B-2	Shuttle of Standard Twins			
	Added Miles	—	86,728	48,611
	Penalty Pay	—	—	2,567
B-3	Circuity Rock Island-Kansas City	8,925	17,850	10,546
B-4	Rehandling Iowa Freight - Aurora			7,950
	TOTALS	51,641	190,010	$121,410

* * * *

7. MINNEAPOLIS GROUP TRAFFIC [ITEM C].

Minneapolis group traffic has been treated separately because of the special impact of the Iowa exclusion on traffic moving to and from Minneapolis, arising from the geographic relationship. The burden is summarized as follows:

Table 6

Minneapolis Group Traffic
Burden of Added Miles and Costs
From Exclusion of Standard Twins from
Interstate Highways in Iowa

		Added Miles of Operation One-Way	Added Miles of Operation Relay	Dollar Burden
C-1	Added Route Miles	125,488	250,976	$151,510
C-2	Semis in Lieu of Twins	160,219	320,438	$117,004
C-3	Added Route Miles and Semis in Lieu of Twins	247,260	494,520	$237,802
C-4	Added Rehandling	—	—	$ 33,954
	Total	532,967	1,065,934	$540,270

* * * *

Each of the burdens which have been calculated in Items A, B, and C, relating to transcontinental, Iowa terminal, and Minneapolis group traffic, respectively, require added capital expenditure and related expenses. I have set forth in Appendix L a calculation of a certain portion of this added burden, as related to each of the items calculated in the preceding sections. The calculations are summarized in the following table:

Table 7

Burden of Added Capital Expenditures and Related Expense
Transcontinental, Iowa Terminal, and Minneapolis Group Traffic
Source: Appendix L

	Depreciation	Licensing	Interest	Total
Item A				
Transcontinental	$104,640	$13,825	$46,767	$165,232
Item B				
Iowa Terminal Traffic	11,016	729	6,307	18,052
Item C				
Minneapolis Group Traffic	63,670	827	17,028	81,525
Total	$179,326	$15,381	$70,102	$264,809

The insurance rate charged to CF for coverage above its self insurance limits does not reflect any differentiation by equipment type. * * *

* * * *

[1089] JOEL LEISCH,

called as a witness by the Plaintiff, being first duty sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

Q Sir, will you state your name for the record?

A Joel Leisch.

* * * *

[1091] Q (By Mr. John Varda) Mr. Leisch, what is your occupation?

A I'm a transportation engineer.

Q What type of work do you do as a transportation engineer?

A I am involved primarily in traffic engineering and highway engineering, involved in planning and design of highways, or reconstruction of existing highways.

Q What type of person or agency or entity do you do that type of work for?

[1092] A Primarily for state and municipal governments.

* * * *

Q Have you, prior to your employment by Consolidated Freightways in connection with this proceeding, ever been employed to present your type of work in a litigation proceeding?

A Not in a Courtroom, no.

* * * *

[1094] Q Now, before defining level of service and related concepts of your field in detail, can you indicate in general terms what level of service analysis is, and whether it is an accepted and recognized procedure?

A Well, to answer your second question first, it is a [1095] recognized procedure around the United States, throughout the states. Level of service is used in two ways. The first way that it is used is in the analysis of operational problems on an existing facility, whether it is a freeway, a two-lane rural road, whatever. The second way that it is used is if a new facility is to be designed, it helps to establish what that design is like, so it is used in both of those matters.

* * * *

Q Is the procedure used by a great number of states, or a selected few, or how would you characterize that?

A The concept of level of service and the application of the 1965 Highway Capacity Manual, the procedures and data contained within it, so far as I know, are used by every state.

Q Would level of service analysis procedure be used by the United States Department of Transportation and the Federal Highway Administration?

A Yes, it is.

* * * *

[1096] Level of service is essentially a measure of the quality of traffic flow on that highway. It is a qualitative measure of a number of factors, actually, which influence the quality of that traffic flow. Some of the factors, for instance, might be convenience and comfort to the driver as he drives on that highway. Another factor might be the speed with which he is traveling over that highway. A third would be safety. A fourth would be travel time, the length of time that it takes him to travel over that specific length of highway, and another would be the operating cost to that driver as he drives on that facility.

* * * *

[1099] Q How is level of service then measured, or how is it determined for a freeway or interstate facility?

A Well, on a freeway, the level of service is determined by first taking the capacity under ideal conditions, and then modifying that capacity for the actual conditions of the roadway at the specific time. By doing so, you then come up with the appropriate level of service.

[1100] A Okay. First of all, with respect to freeways, to help to get an understanding of what the differences are between the levels of service—and I believe it was already mentioned previously that levels of service are defined from A through F—A, B, C, D, E and F—with a higher quality of service or higher level of service to the traveling public being level of service A, and the lowest of all or complete failure of the facility to accommodate traffic is level of service F, * * *

* * * *

[1120] Q In the field of level of service analysis, have 65-foot twins and 55-foot semis been treated as equivalent vehicles for level of service determinations?

A Yes, they have.

Q Has there been any study of the subject of effects of different types of commercial or truck vehicles with respect to [1121] level of service analysis?

A Yes, there has been.

Q Can you describe it or indicate what it was and what the results were?

A Well, the most recent study that was done was conducted by the Midwest Research Institute, concluded about two years ago. It was sponsored by the National Cooperative Highway Research Program, referred to as NCHRP, which is a branch of the National Academy of Sciences, and documenting that research was actually published by them as a result of the research. The document itself was NCHRP Report 185.

Essentially the research was accomplished to try to determine the effects of various vehicles in the traffic stream on capacity, level of service, stability of traffic operation, et cetera. As a result of the study, it was concluded that there really was no difference in the effect of traffic operation between semis and twins.

* * * *

Did you do any further evaluation as to whether to treat 65-foot twins differently than semis in connection with your level of service analysis done in this case?

A Yes, I did. There were four things that I looked at. [1122] First was the weight-to-horsepower ratio, which would have an influence of truck speeds on grades, and would have possibly a greater effect on the level of service on a facility where there were significant grades.

Secondly, the turning characteristics of twins versus semis.

Thirdly, the passing characteristics; for instance, a vehicle that is overtaking and passing a twin versus a semi.

Fourthly, with respect to the safety between the two.

These are a variety of things which may have an influence on the level of service.

* * * *

Q For vehicles which would operate cross country, such as those operated by Consolidated Freightways, would a 3 to 4 thousand pound difference in the gross weight of the vehicle, as between a twin and a semi, significantly affect acceleration and deceleration characteristics in terms of a level of service analysis on Interstate 80 in Iowa?

A No, it would not.

Q If I asked you the same question with respect to a [1123] difference of 7 or 8 thousand pounds between twins and semis, the twins being the heavier, would your answer be the same or different?

A Yes, it would be the same.

* * * *

[112[illegible]] Q There's been an observation made in some of the testimony in this case concerning cars growing smaller in relation to commercial vehicles on the highways, and being less powerful today than historically. Is that an observation which you would think would be consistent with your experience and your perceptions in making level of service analyses, or inconsistent?

A No. We have not experienced in the last several years—have not shown that there is enough of a difference to make a difference in the level of service analysis. The only difference that there seems to be is in the height of the eye of the driver above the roadway, which makes a difference in the sight distance that the individual might have, but that is associated with the individual vehicle, and not as associated with trucks or other vehicles.

Q In connection with your consideration of whether to treat 65-foot twins differently than semis in your level of service analysis, you indicated you gave some consideration to safety, generally. Can you indicate what considerations—what you did?

[1129] A Well, first of all, to review the same publications and same studies that Dr. Glennon did, and also several others, one of which was this NCHRP report, and the conclusion that I reached is that there really was no difference, at least for level of service determination.

Q Did you take a look at the 1975 Iowa studies?

A Yes, I did.

Q Do you rely on different types of studies of data published in the field of highway engineering and related fields in your profession?

A I certainly do.

Q Would you regard that 1975 Iowa study as the type of source from which you might draw a conclusion, or upon which you might rely in drawing conclusions in your field?

A Yes, it is.

Q How did you find the study compared to others that you may have viewed over the years?

A Well, I felt that it was a recently comprehensive coverage of the subject, and the conclusion that I reached as a result of reading it, in particular in relation to safety, is that there really was, for all practical purposes, no difference between twins and semis from a safety standpoint as they would affect level of service.

Q From your analyses of weight to horsepower ratios, turning, passing, and safety, generally, did you conclude that [1130] there was or was not any reason to vary from the practice in your field in level of service analysis of treating 65-foot twins and semis as the same for the level of service analysis?

A Yes. I concluded that there really was no difference between the two. I might further add that—to clarify, perhaps—that I'm on the Transportation Research Board Highway Capacity Committee. We are responsible for the looking at, and, in many cases, responsible for all of the research that is done in the field of highway capacity and level of service.

We are in the process of updating the 1965 Highway Capacity Manual. There are some weak places in it. In the next several years there will be some new procedures and some new data available in a new manual, which will update the present one that we have.

In the deliberations that we have had to this time, never has the subject of twin, or differences between twins and semis come up, and that, I would conclude, is the general feeling of the committee, that there really is no difference between twins and semis, and all the members are aware of essentially all the research that is being done in the capacity in level of service field.

* * * *

[1137] Q (By Mr. John Varda) Now, can you indicate, in a summary fashion, what you found on Interstate 80 and what you found on U. S. Highway 36?

A Interstate 80 from the Mississippi line—excuse me —from the Mississippi River or the Illinois line to the Missouri River and the Nebraska line is a freeway facility. Basically, it is a four-lane divided freeway facility with a complete control of access. It generally has full 10-foot shoulders on the right, and a partial shoulder, although fully stabilized out to 10 feet on the left.

In most locations on bridges there is a full shoulder on the right. In most cases there is somewhere between a two and four-foot shoulder on the left.

The grades are generally minimal. There are several locations in the western part of Interstate 80 where grades approach 2½ to 3 percent, which is approaching the maximum for a rural interstate facility where the design speed or the maximum safe speed has been selected at 70 miles per hour.

In terms of curvature, horizontal curves, as they are referred to, it was only in the Des Moines area and in the Council Bluffs area where there were any curves that even approached the minimum or maximum, whichever way you would like to look at it, or a design speed of 70 miles per hour, so essentially the conditions on Interstate 80 are ideal to produce as high a level of service as a freeway facility could.

[1138] Q Can you give us a similar summary of your observations with respect to Highway 36?

A U. S. Highway 36 significantly varies from one end of the state to the other. We not only have the differences between two-lane and multi-lane sections, but we have significant differences even within, for instance, two-lane sections where there are significantly different design standards.

As an example, in the western part of the state, large portions of two lanes of U. S. 36 have been completely reconstructed. In fact, in many cases they are on new alignment, and the design speed that was used is 70 miles per hour.

* * * *

A Consequently, some portions or some of the two-lane segments on the western portion of U. S. 36 have been completely reconstructed and have a very high type design with 10-foot shoulders on the right and nice flat side slopes, and in many [1139] cases bridges have been widened so that you do have full shoulders across those bridges also.

* * * *

A Okay. There are large portions of the sections in the western—execuse me—the easern half of the state—these are two-lane sections that I am talking about—that are still on the alignment that was originally constructed for U. S. 36, most likely back in the '20's or the '30's. I would say that the design speed is certainly no higher than 60 miles per hour, or the maximum safe speed for which you could drive that facility is 60 miles per hour.

In many cases—not in many—but in some cases the pavement is narrower than 24 feet or 12-foot lanes, which is the optimum for maximizing or optimizing the level of service.

[1140] In many cases there not only are not shoulders, but in many cases the shoulders are not even paved. They are merely stabilized shoulders with some gravel, for instance, that has been placed on them. In cases like this, if a vehicle would inadvertently, as a result of a flat tire, as a result of a poor passing maneuver being made, run off onto that shoulder, that individual vehicle would have a serious problem, just to give an example of the difference between a paved shoulder and a non-paved shoulder.

The alignment in both vertical and horizontal in some of the sections in the eastern portion of the state on 36 are really very poor, and do dictate the maximum safe speed of 60, and in some cases it might even be less than that.

* * * *

[1144] Q As a result of this level of service analysis, did you reach some conclusions with respect to the operation of 65-foot twin trailers on the Highway 36 facility in Missouri and the Interstate 80 facility in the State of Iowa?

A Based on existing traffic, if you introduced—I believe the number 200 twins was used, which you might have if you shifted twins from U. S. 36 to Interstate 80. If you put 200 additional trucks or twins on Interstate 80 in relation to today's traffic, it would really have absolutely no influence on the level of service at all. We are talking about an increase—let's say an average of—Perhaps there is an average of 16,000 vehicles per day, average daily traffic, across the entire state, and you increase 200 trucks in the traffic stream. That's an extremely small amount, and when we do level of service analyses, we deal with a design hour or a peak hour, which normally occurs during the morning rush hour or peak period and during the afternoon, and generally large trucks avoid, in particular in urban areas and urban freeways, facilities during those periods of time, so that, for instance, the percentage of trucks that I have indicated there, which averages close to 20 percent along Interstate 80 over the length, that is daily, and some of the classification counts have indicated that during peak hour, for instance, in the Des Moines area, that it is about 10 or 11 [1145] percent, and in some of the rural areas it is around 12 or 13 percent during the peak periods.

Q Do you have an opinion with respect to the effect shifting twin trailer traffic from Highway 36 to Interstate 80 would have on the level of service of Highway 36?

A Yes. It is very possible that the shift of those vehicles may have a measurable effect or measurable improvement in the level of service, primarily related to operating speed, which is the major item we used to define level of service on U. S. Highway 36.

I think it is interesting, just using some general values, if we talked in terms of 200 trucks—we are shifting, let's say, 200 trucks from U. S. Highway 36 to Interstate 80, and in looking at this, if we assume that Interstate 80 as an average has 20,000 vehicles a day on it and there are approximately 20 percent trucks, that means we have approximately 4,000 trucks that are crossing Iowa each day. These are trucks that have three axles or more. Twenty percent or 4,000 are crossing Iowa.

If you add 200 to it, that's a five percent increase in the number of trucks, but it is an increase from 20 percent to 21 percent of the proportion of trucks in the traffic stream in relation to all vehicles.

[1146] Q (By Mr. John Varda) Is that proportion of trucks relevant to level of service?

A That's correct. It's not the volume of trucks, but the proportion of trucks in relation to the total number of vehicles in the traffic stream. On U.S. 36, for instance, if we look at it today, 4,000, 5,000, 6,000, as an average, if we view some of the heavier sections in the Western portion—let's use 6,000—we have approximately 20 percent trucks on that, also, and that means we have 1200 trucks a day operating across U. S. 36.

If we take 200 trucks off of that, that means there is a 20 percent reduction in the number of trucks, but in relation to the total amount of traffic, there is a reduction from 20 percent trucks in the traffic stream to 16.7 percent trucks, which could be a significant decrease, and enough to make a measurable difference in the operating speed.

Q Now, you started this discussion of your conclusions in relation to the present conditions. Would there be any difference in your conclusions with respect to the projected conditions in 1990?

A Well, the observations would be similar. If the number of trucks was held constant, it would have less of an influence, possibly, if there was going to be any influence. I have indicated on the two exhibits that you see there, that [1147] in 1990 the traffic increase, what it will be, the proportion of trucks, the percentage of trucks that is indicated there, which is peak hour, not daily.

This, again, is based on information provided by the Iowa DOT. Of course, that was used, and a peak hour volume was used; and, of course, the character design of the facility was used to determine the level of service in the year 1990.

* * * *

[Testimony of Joel Leisch continued, Transcript page 1200]

* * * *

[1161] EDWARD DICKINSON,

called as a witness by the Defendants and Defendant-Intervenor, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BITTNER:

Q Colonel, for the record would you please state your name and your present address?

A My name is Edward Dickinson. I presently live at 1105 Southeast Innsbruck, Ankeny, Iowa.

Q What is your present employment, sir?

A My employment is with the State of Iowa, more especially the Department of Public Safety. I am the Chief of the Division of State Patrol.

* * * *

[1162] Q Based on these 28 years of experience with the Patrol, can you tell us whether or not there was any correlation between increasing traffic on Iowa highways and its effect on accidents?

A Yes, sir, there is.

Q What would that effect be?

A The more traffic, the greater the likelihood of accidents.

Q Does this relate to automobile traffic as well as truck traffic?

A Yes, it does.

[1163] Q That's the increased traffic effect. What would those problems be?

A Any increase in traffic also creates a greater probability of infractions of the motor vehicle laws, of which we are charged with the enforcement of.

* * * *

[1164] Q Colonel, do you recall testifying in an action captioned Motor Club of Iowa versus the Department of Transportation in 1976?

A Yes, I do.

Q In that action, the DOT—or the Department of Transportation—had estimated that if the 65-foot double-bottom truck were allowed on the Iowa interstate system, that this would result in an annual increase of 75,000 additional truck vehicle trips. Do you recall that?

A Yes.

Q Did you have enforcement problems in 1976?

A I did.

Q What were the nature of those problems in 1976?

A Much as they are today; complaints on speed and some types of vehicles.

Q Did you have any complaints as it relates to trucks?

A Yes, I did.

Q What were those complaints?

A Mostly of setting the pace as far as speed or exceeding the speed limits, intimidation of trucks over smaller vehicles [1165] as far as following too closely on inside lanes, attempting to get access for greater speeds.

* * * *

[1166] Q (By Mr. Bittner) Having given you those basic facts, Colonel, I ask you whether or not projecting the increase by Mr. Nimmo of 10 to 12 percent, or 228 to 230 additional truck vehicles on the interstate system, this increase would provide you with any additional enforcement problems?

A Yes. I feel it would some, yes.

Q Would it provide any additional safety problems, of which you are aware?

[1167] A It could be expected, yes.

Q Would you expect that you would have to take patrolmen off of the primary system and put them on the interstate system?

A It could call for some reassignments, yes, on a day-to-day basis.

Q What effect would that have?

A Well, as has been the case ever since the 55-mile-per-hour speed limit, we have had to continually move more of our personnel toward the interstate system to try to take a better control. If we continue to increase vehicles on those systems and we still meet with the same amount of resistance to the 55, I can only expect that we will have a continued problem of relocation.

* * * *

[1168] Q Chief, I have asked you questions relating to the 65-foot double bottom truck. Are you acquainted with that vehicle?

A Not all that well, although I am acquainted with a few operated within the state within the 60—

Q We do not have 65-foot double bottoms in Iowa?

A No.

[1169] Q But we do have 60's?

A Yes, sir.

Q Are there any particular characteristics of that vehicle which would cause you to have law enforcement problems?

A The one that I would be most concerned about—I'm familiar with some of their characteristics, which is not all that different from the 60's, but the one I think more particularly about is it being a vehicle which cannot be successfully operated in reverse.

At the scene of an emergency, many times it requires clearing lanes for emergency access, ambulances, retrieving equipment, and it is my understanding that it's very difficult to operate these vehicles in reverse successfully for any distance.

* * * *

A Yes, sir. Most passenger vehicles can be attended to, as far as investigation, by a single trooper. Retrieving of that vehicle is much more quickly done, for the reason that most wreckers can accommodate that vehicle and retrieve it and remove it quickly.

With the larger generally commercial vehicle, truck, it requires much more time and more personnel, of course. If those vehicles were overturned in any way, usually they are [1170] freight-carrying vehicles, which are loaded, and it requires a number of our officers to control the scene and provide protection for the other motoring public.

Some numbers of hours and almost days can go by before that truck can be properly unloaded into other vehicles, and the retrieving equipment is not all that available for that size of vehicle. It takes some time for those vehicles to respond, and then requires some hours of blocking lanes of that interstate system, if that would be the roadway, in order to retrieve it; so there is a greater number of hours protecting the scene, retrieving the freight and retrieving the vehicle itself.

Q Are there safety problems at the scene?

A Usually much more so, yes, than there is with a smaller vehicle.

Q Chief, right now we are in the middle of the summer, and we are not, hopefully, thinking about last winter, but let's return to it for a moment. Are there any problems that you experience of a safety and law enforcement nature during the winter months during icy and snowy conditions that provide you with more problems than you would normally have?

A During the winter months, there is a greater possibility of accidents from loss of control because of surface conditions. This is hazardous to all vehicles; but, of course, with the larger truck vehicle, if they do go out of control, then we have a much more serious problem with them. It's much [1171] more difficult for them to control those larger vehicles than it ordinarily would be.

During the blizzard of last year in eastern Iowa, as a good example, many of those larger vehicles, once they are stalled and the operators abandon them, they are much more difficult to retrieve. The brakes are set. It's very difficult to bleed off those brakes. There are very few vehicles that retrieve them. The fuel gells. They have to be withdrawn by some sort of retrieving equipment. It creates a greater number of man hours in taking those vehicles out of those areas.

Q Are there instances in which during these winter months the interstate system is reduced to a one-lane system each way?

A Yes. During those times that the Department of Transportation is attempting to properly clear those lanes, we have had to restrict travel to one lane.

* * * *

[1172] Q If we were to add an additional 228 to 230 vehicles on an annual basis to the interstate system, would this provide additional problems?

THE COURT: On a daily basis?

MR. BITTNER: On a daily basis. Would this provide additional problems during these winter months under icy and snowy conditions?

THE WITNESS: Yes, I believe it would. Any additional traffic would cause—could cause additional problems.

* * * *

[1177] CROSS EXAMINATION

BY MR. LEDERER:

* * * *

[1180] Q Are you aware that because of the ban on 65-foot twin trailers in Iowa, that traffic is diverted around Iowa in other states over two-lane and four-lane roads, some of which are quite old in design?

[1181] A I would assume that some are, but I was aware that most of those are on multi-lane highways and restricted to such.

Q Does the presumably create winter problems in those states?

A If they are on multi-lane highways, perhaps no more than we could expect, no.

Q If they were on two-lane highways?

A Those that would be on two-lane highways, and if they were quite old, I would expect that they would have more of a problem, yes.

* * * *

[1183] Q When I asked you whether the difference in severity was related to weight versus size, you said both. What information do you have that says that the severity of an accident is related directly to the vehicle length independently from the weight of the vehicle?

A I have nothing on length.

* * * *

[1184] Q Would you suspect that large commercial trucks would have a substantially lower accident rate than automobiles?

* * * *

A Yes, I believe they do.

* * * *

[1187] Q Let us assume, because it is in evidence in this case, that twin trailers that normally would have the most direct route through Iowa are now being diverted around Iowa principally through Missouri. They leave I-80 in Illinois, if they are going westbound, go across Missouri, and connect with I-80 in Nebraska. That's a circuitous route, longer route than the direct route through Iowa. As a result of that longer route, there is increase in vehicle miles?

A Yes.

Q My question to you is would not this increase in vehicle miles increase the accidents in other states?

A Yes, I'm sure it probably will.

* * * *

[1188] Q When I listened to your testimony, with the exception of backing—correct me if I am wrong, because I don't want to mischaracterize your testimony—but all of the problems that you addressed in regard to your testimony were problems that you associated with large trucks, generally?

A Yes, that's true.

Q With the exception of backing, you are in no way —you were in no way suggesting that this problem is greater with 65-foot twins than with a 60-foot twin, or another semi?

A No, that's right.

Q Do you have an opinion as to whether the 65-foot twin is safer or less safer than a 55-foot semi?

A I really don't. I'm not that all familiar with the exception of that one characteristic.

Q Do you know how far a 65-foot twin trailer can be backed?

A No, with the exception of information that has been given to me about those.

Q Who gave you that information?

A I don't recall. It was in an earlier—it might have [1189] been back in the earlier trial. As I recall, it came up during that time, but that's the only one question I have about their real safety, other than any operational problems.

Q You don't know how far, if at all, they can be backed?

A No. I would imagine it might depend upon—somewhat upon the operator, but I can't positively feel that they could be successfully backed for any distance without losing their control.

* * * *

Q I'm sorry. Let me go back over that a moment. Would a 60-foot twin trailer be more difficult or be able to be backed only a shorter distance than a 65-foot twin trailer?

A I should think they would be somewhat equal in their problem.

* * * *

[1190] Q If the units can be backed up sufficiently, would you regard that as reducing or negating your concern?

A Yes, if it could be demonstrated to me that this could be successfully done, I certainly would feel differently about that problem.

* * * *

[1191] Q Colonel Dickinson, you testified earlier that you do not have 65-foot twin trailers in Iowa, is that correct?

A We do not have 65-foot twins?

Q That's right.

A Not double bottoms.

Q Nowhere in the state?

A Nowhere in the state, no.

Q Are you acquainted with the border city exemptions?

A The border city exemptions, yes, but that's only into that corporate city limits, and back out again, for service access.

Q When you say "for service access", would that be for access to Iowa businesses?

A Correct, on those border cities, correct.

* * * *

[1195] Q Do 65-foot twins presently run in all of the states adjoining Iowa?

A Yes, with some restrictions.

Q Have you discussed with your corresponding highway patrol chief or with other motor vehicle enforcement officers their experience with twin trailers?

A No, I haven't.

Q Do you know Colonel Crawford—

A Yes, I do.

Q —with the Minnesota State Highway Patrol?

A Yes, very well.

Q Do you know Colonel Eisnach, I believe the name is—

A Of South Dakota?

Q —of the South Dakota State Highway Patrol?

A Yes, I do.

Q Are you acquainted with Major Adkins of the Kansas Highway Patrol?

A No, but I do know the superintendent well.

Q Are you aware that all of these officers have given depositions in this case regarding their experience in their states with 65-foot twins?

A I am told that they have, especially Eisnach, I believe.

[1196] Q In attempting to determine whether or not the additional vehicles would cause problems for your enforcement, wouldn't you think it pertinent to find out if they created problems in other states?

A I have thought about it, but I thought in order to keep an open mind about our particular problem, they now have them in their state, and I thought that perhaps it might be better if I stayed strictly to our own personal problems. Their states aren't altogether like ours, especially South Dakota, which has a much different terrain than ours, so I didn't think that his information would necessarily relate to ours here.

* * * *

[1200] JOEL LEISCH,

resumed his testimony as follows:

CROSS EXAMINATION

BY MR. PAFF:

* * * *

Q Are ambient conditions snow, sleet, rain, fog, those types of conditions, sir?

A Yes.

Q Is it stated there, sir, in that manual that these conditions affect the ability of a roadway to accommodate traffic?

A Yes, that's true.

Q Does it also state there that because there is very limited data to quantify their effect on capacity, that they are [1201] not discussed in detail in this type of analysis?

A That's correct.

* * * *

[1203] Q Now, with regard to the level of service analysis, did you add in any factor related to the cost of a four-lane facility, as opposed to a two-lane facility?

A No. Level of service analysis— Are you speaking of construction costs?

Q Yes, sir.

A No. In level of service analysis, that is not part of it.

* * * *

[1204] Q With regard to the level of service concept, I believe you indicated that there were about six items that you described as comfort, convenience, speed, safety, time and cost, is that correct?

A Yes, those are also referenced here in the document that you have.

[1205] Q (By Mr. Paff) Does that also indicate, with regard to all of those items, something with regard to the desirability of all these factors?

A Yes.

Q What does that indicate, sir?

A It really has to do with equality. If we are talking about operating costs, for instance, for the driver to operate his vehicle, if we make the highway more efficient and generally provide a higher level of service, then his operating costs would generally go down. That's just one example. You can apply those, of course, to all of the other factors that are listed there.

Q Directing your attention to Page 78 of this document, in the second column where it relates to various factors that you have just described, it says, "Desirably, all of these factors should be incorporated into a level of service evaluation", which I assume you did in your analysis here.

A Yes.

Q Then it says, "As yet, however, there are insufficient data to determine either the values or the relative weights of certain of the six factors listed."

A That's true.

Q Now, so your analysis would weight, as I understand it, the travel speed, as what you picked out as being the relevant criteria?

[1206] A Well, it is not what I picked out. It is what has been determined for use in a level of service analysis.

Q Would that be considered co-equal with, for example, safety or economy?

A Well, because, as it explains in the text, sufficient data is not available to be able to assess adequately some of those other factors, operating speed has become the principal determinant.

* * * *

[1207] Q Who would bear that responsibility with regard to maintaining that service level?

A The agency who is responsible for the facility.

Q What agency is that with regard to Interstate 80 in Iowa?

A It would be the State of Iowa.

* * * *

[1208] Q Did you examine any particular critical bottleneck location in your trip across Iowa?

A * * * It was evident, however, in driving the Des Moines portion of Interstate 80 that potentially there could have been some bottleneck locations, which could be anywhere from level of service C to level of service E.

Q Now, with regard to those bottleneck locations which your manual says are critical, what happens when you have a critical bottleneck situation, and why would a bottleneck be critical?

A A bottleneck situation could be critical in that if [1209] the level of service drops, let's say, to level of service F, as may be the case when there is an accident for which we normally do not design a facility or apply the concept of level of service when there is an accident, with queuing vehicles, which generally creates stop-and-go type of conditions, generally we would see that the accident rate may go up.

Q This queuing that you describe, is that an influence on a bottleneck situation where you are affecting traffic on a four-lane facility generally downstream and upstream? In other words, you may be backing traffic up behind the bottleneck and spreading it out in front of the bottleneck?

A Yes, that normally occurs. You have a constraint, essentially, in your system, and once the vehicles pass through that then, of course, they would spread out on the highway. You have fewer vehicles per lane beyond the bottleneck than you do, of course, approaching it.

Q Did you make any study with regard to critical locations that might exist along Interstate 80?

A No. Normally for the type of study that I was engaged in doing, you would not do that. If I was engaged specifically to look at bottleneck locations in the Des Moines area, I would have done that, but I was looking at a system, and this is a normal approach that a traffic engineer or a highway engineer would take in analyzing a facility of this length.

[1210] Q Is the difference similar to taking a snapshot of a crowd and a snapshot of two or three individual people, with regard to the sections that you looked at?

A Well, the slides, the photographs that I took of the facilities were to give an overall impression of the design characteristics of the facility. As it happened, of course, you can see vehicles in those photographs also. The idea of taking those photographs was not to record the vehicles, but to record the design nature of the facilities and the terrain through which the facility went, and in some cases to observe the pavement, as well.

Q My question was directed towards the sections that you looked at. For example, if I look at Section 1 on your exhibit dealing with Interstate 80, I notice that is about a 10-mile section, is that correct?

A Yes.

Q If I look at Section 2, that's about a 100-mile section or so, roughly.

A That sounds about right.

Q Now, does it make a difference, with regard to the length of section I am looking at, as to the level of service I might expect in a particular area?

A Well, from subsection to subsection within these sections there is going to be a variability in the level of service. My purpose was not to look specifically at those [1211] subsections, but at the border view of Interstate 80 itself.

Q Now, if we look at your analysis of the freeway system as contained in your manual behind the first blue divider, are these critical sections discussed in some detail?

A Yes. The analysis procedures are described within the text, but they are described not only for subsections, but a more broad view. I think I brought that out yesterday in the testimony that I gave where, for instance, there were tables provided for adjustment factors for trucks as influenced over long sections, utilizing terrain as the input.

Q But does not the manual state that considerable emphasis is also placed on steps which will minimize the possibility of spot or temporary overloading at any point, whatever the cause may be?

A That's true, but that is a different type of analysis than the one that needed to be performed here.

Q In other words, might it be a valid inquiry, with regard to an analysis of the capacity of Interstate 80, to look at particular critical locations with regard to increased traffic volume?

A Well, if my charge had been to look at critical locations—if I was, for instance, retained by the State of Iowa, the Department of Transportation, to look at critical locations and make recommendations for improvement to those, yes, I would have done that, but I am looking at the system [1212] across the state, and not at isolated locations.

I might further add that the bottlenecks that you are talking about generally occur under unusual traffic conditions or during peak periods of traffic flow, which normally are early morning and late afternoon, and in those periods of time trucks generally avoid bottleneck areas, such as, for instance, urban areas where traffic generally is significantly higher, in particular during peak periods.

Q Have you done any studies relating to the avoidance behavior of trucks in particular periods of the day?

A That's not my responsibility to do any studies. I rely on other studies that are done, and also on the many traffic counts and traffic analyses that have been done in the past and that I have done for urban as well as rural freeways. The data provided to me by the State of Iowa shows exactly the same kind of thing, that the proportion of trucks on Interstate 80 in the traffic stream is significantly less during peak periods than it is on a daily basis.

* * * *

[1214] Q The text at the bottom of the page—could you read that for us, beginning with "The operating characteristics".

A "The operating characteristics at each such location must be investigated for the effect on roadway capacity and level of service. Unless the adopted level of service is met as a minimum at every point on a highway, the restrictions will cause traffic operations to fall below the desired level of service, often for extended distances. In the extreme where operation at capacity is required, any restrictions will be capacity limitations, bottlenecks, preventing full use of the remainder of the section. An approach to the freeway level of service thus requires analysis of each potential restriction or bottleneck within the roadway section". Is that sufficient, or do you want me to continue?

Q Is that what we are talking about when we are looking at critical locations?

A Yes, if you are doing a critical location analysis. The facilities are not designed—looking initially at critical locations. You look at a system first, at the entire length of the facility, establish what your level of service is, or determine what your level of service is, generally, on an [1215] existing facility, and then you begin to look at the individual bottleneck locations, if that is what the study is to contain.

* * * *

[1230] Q I understand that. With regard to your analysis, would that sentence apply that, "Never should the variance be more than one level of service"?

A Between Section 1 and Section 2, as an example?

Q Yes.

A Yes. It could be applied in this case, but the problem here is that we are looking at the year 1990, and this is a design that is in existence; and, consequently, in looking at something like this, it should indicate that something needs to be done. Actually, I think I need to clarify, if I may. I would like to change my answer; instead of "yes" between the two subsections to "no" between the two subsections. The reason [1231] is that one is urban and one is rural, and a different design level of service is used for the analysis.

Q So under what you are telling me now, I can't even compare Section 1 to Section 2 on Interstate 80, is that correct?

A Well, the only reason to compare 1 and 2 is that it would be desirable to have level of service C operation in 1 and level of service B operation in 2, primarily because they are urban and rural, and it may be that subsections within Section 1 may operate at D, or perhaps even E in the year 1990, but that does not necessarily mean that adjacent subsections would operate in the two different levels of service, levels of service that are two apart, for instance, as with B and D.

Q Have you been through the intersection at I-35 and Interstate 80 going north to Minneapolis?

A Yes, I have been through that interchange.

Q What level of service does that have?

A You cannot identify a level of service with an interchange. You identify a level of service with a piece of roadway.

* * * *

[1232] Q And could I look at your analysis there, and if you look at your numbers across the bottom, the

A's, B's and C's, could I assume that the variance between levels of service would be different or the same in 1990?

* * * *

A Well, in most cases the subsections are going to be—I don't think we really call it worse, but the level of service is going to be gradually reduced as a result of increasing traffic volume.

Q The whole of all these subsections is equal to the sum of the parts?

A The average of the subsections.

Q So, again, I ask you if we have a two category variance in Section 1 and Section 2, in 1990 that would not fall within the desirability of the comments at Page 254?

A Again, are you making reference to the variance of two levels of service between Section 1 and Section 2, or within [1233] those sections?

Q Between Section 1 and Section 2.

A Again, what I stated before is that urban areas are designed at a different level of service, and generally the driver is willing to accept a lower level of service in urban areas than he is in rural, and that's one of the reasons for the differences in selecting level of service in rural areas and in urban areas, and it's possible that there is some sections, as an example, in the year 1990 where it indicates level of service D in Section 1, which is generally throughout. There may be some sections that operate at C, and some sections that operate at E.

* * * *

[1238] DENNIS EHLERT,

called as a witness by the Plaintiff, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HANCOCK:

Q For the record, would you state your name, spell your last name and give your address?

A Dennis Ehlert, E-h-l-e-r-t, Route 1, Cambridge, Iowa.

Q What is your present employment?

A I am Director of Motor Vehicle Enforcement, Iowa Department of Transportation.

* * * *

[1244] Q Earlier this morning Chief Dickinson testified that he thought there was some restrictions on the movement of 60-foot twin trailers in Iowa. Are you aware of any limitations?

A There are no restrictions, other than local truck routings.

* * * *

[1245] Q In your experience in the motor vehicle enforcement area with the State of Iowa, has your department or office ever been involved in either a formal or an informal understanding that a particular size or weight law would not be enforced in a given situation?

A Yes.

Q Would you describe one of those situations?

A The border city agreement basically started during World War II when vehicles of lengths legal in Nebraska and South Dakota were permitted to come into Sioux City, primarily livestock hauling vehicles. That border city understanding or agreement was the guideline until the passage of the border city law that made legal that type of operation.

Q What was the date of the law, or the year?

A I believe it was 1942.

Q And the statute?

A The statute was adopted, I believe, in 1972. I could be wrong on that.

* * * *

[1246] Q So from approximately 1942 to 1974 there was an informal understanding that was not appearing in the statute at all?

A That's correct.

Q That would be approximately a 30-year period then?

A Yes.

* * * *

Q How would a particular city be added to the informal understanding?

A Basically it would be the requirement that they were a border city, and that the adjoining state had limits that would be in excess of Iowa's limits.

* * * *

[1247] Q So assuming that the Nebraska law, for instance, permitted 65-foot twin trailers, I could move a twin trailer from North Platte, Nebraska into Council Bluffs, but no farther east into Iowa?

A That's correct.

Q I could move a twin-trailer vehicle from Council Bluffs west into Nebraska?

A That's correct.

Q So there would be goods delivered both into Council Bluffs and out of Council Bluffs, possibly, under that exception?

A Yes. That was part of the criteria, that it had to be an interstate shipment that was coming for delivery to the border city, or the vehicle was going back out with a shipment.

Q On the other hand, I could not use that same border city exception or understanding to transport goods from North Platte, Nebraska to Chicago using Interstate 80 across Iowa?

A No, you could not.

* * * *

[1251] A This is a memorandum that I issued in reference to interpretation on the issuance of permits for the movement of containerized cargoes, dated May 30, 1973.

Q Could you give a brief description of exactly what that memorandum involved?

A It was a situation that existed at that time where containers were loaded with export commodities, specifically in this case, hides, cattle hides. They were for export to Japan, and other foreign countries.

In order to meet the export requirements, the containers had to be loaded to a specific volume, because of the size of the containers, and the method that they were transported, over the roads, they were in violation of Iowa weight limits.

In view of the nature of the shipments as exports, we concluded that they should be considered indivisible loads, and, therefore, eligible for oversize permits.

Q But if they had been considered divisible, then they [1252] would not have qualified for the permit?

A That's right. They would not have qualified for the permit, and would have been illegal for operation on the roads.

Q You mentioned one type of goods that was moved was cattle hides. Was there any other kinds of goods moved?

A I believe subsequent to this there were shipments of grain also for export.

Q In fact, are grain and cattle hides divisible?

A Yes, they can be reduced.

* * * *

[1253] Q Was this cargo—the cargo that was transported, was it cargo being exported from Iowa?

A Yes, it was Iowa origin loads.

* * * *

[1258] Q Could you read down the list of the cities that do have [border city] ordinances?

A Yes. The cities are Akron, Council Bluffs, Sioux City, Dubuque, Davenport, Bettendorf and Hawarden.

Q Those would be the list of cities that your officers would operate under in knowing what laws to enforce in a border city?

A That's correct.

Q So if a particular officer was in a border city and saw a twin trailer, 65-foot twin trailer truck, and that was legal in the adjoining state, he would have to refer to the list of the particular cities that you maintain that have an ordinance, in order to know whether to give a citation, or not to give a citation?

A That's correct.

* * * *

[1259] Q Now, could you turn to Page K-16 of Exhibit 53, and identify that document by reading its title?

A "Chapter No. 1539; an ordinance permitting 65-foot double bottom trucks within the City of Clinton, Iowa on certain streets, and providing penalties for the violations thereof.

Q What is the date that that ordinance was adopted?

A It appears to say October 14, 1974.

Q Now, I notice back on your list on Page K-7, Clinton is not one of those cities listed?

A K-7?

[1260] Q Yes.

A It is not.

Q What is the enforcement situation in the City of Clinton?

A We are not aware that Clinton is—has this ordinance for border city agreement.

Q Mr. Ehlert, in your experience with law enforcement on the Iowa highways, have you ever developed any opinion regarding safety on whether extra width versus extra length is a more or less safe or unsafe situation? How do you view width versus length in terms of safety?

A To me, a wider vehicle would present more problems than a longer vehicle.

* * * *

Q Would you turn to Page A-1 of Exhibit 53? In Page A-1 through A-5—those are pages I have prepared, and I have attempted to characterize some of the different exemptions under the Iowa statute, giving a brief description of the exemption and statutory authority for that exemption. This is my analysis, so that's clear on the record, before we start asking about those matters. In your knowledge, are some of the statutory exemptions —would it be your determination that several of those exemptions relate to the movement of agricultural goods, or relate to the agricultural industry?

[1261] A Yes, several of them.

* * * *

Q No. 2 relates 60-foot truck-tractor and trailer combinations for the movement of livestock. Would you consider that an agricultural-related exemption?

A Yes.

Q On Page A-4, looking at Item No. 14, what kind of movement is described in Item No. 14?

A The movement of hay, straw or stover, which is cornstalks.

Q Could you describe that kind of movement, what the statute is getting at?

A Well, the statute here is regarding situations where the movement of hay, straw or stover, where the load of that material might be in excess of the maximum width, would provide [1262] that the load be exempted from those dimension requirements.

* * * *

Q Are there situations for the over-width movement of hay, straw or stover when you would not have a permit?

A Yes, when they are moved on an implement of husbandry.

Q So if the farmer himself were moving an over-width movement of hay, straw or stover, he can do that without a permit?

A That's correct.

Q This Item 14 would be getting at those situations where the farmer is not moving the hay, but somebody else is moving the hay? He can also move an over-width load as long as he gets a permit?

A That's correct.

Q The export of grain and hides that you mentioned earlier in the containerized cargo exception, I think that's described on Item No. 15 on Page A-4. Would you consider that an agricultural-related exemption?

A Yes.

* * * *

[1263] Q Could you briefly characterize what those emergency proclamations involve?

A During the harvest season, the emergency proclamations covered the movement of grain in excess of the Iowa weight limits, provided permits were obtained.

* * * *

Q Could you turn to Page G-4? Would that be the hay proclamation you just referred to?

A Yes, it is.

Q Could you take a minute to read the paragraph that starts, "Now, therefore", and indicate whether that was strictly for intrastate movements versus interstate movements?

A This particular declaration was for the movement of intrastate movements only.

* * * *

[Testimony of Dennis Ehlert continued at Transcript page 1280]

[1264] GOVERNOR ROBERT D. RAY,

called as a witness by the Defendants and Defendant-Intervenors, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BITTNER:

Q Governor, for the record would you please state your name and address, sir.

A Robert D. Ray, 2300 Grand Avenue, Des Moines, Iowa.

Q You are Governor of the State of Iowa?

A Yes, sir.

* * * *

[1265] Q Can you briefly describe the nature and extent of that issue?

A Well, that issue has been with us for a considerable period of time, even prior to the time that I became Governor. My predecessor sent one bill back, as I recall, and after I was elected the issue came before the legislature each year; and in 1974 a bill was passed to authorize 65-foot double bottom trucks.

After much consideration, I vetoed that bill, and the issue continued to come before the legislature, but has not passed at any time since then, and the bill has not been received by me after that one.

[1266] Q Going back for a moment to 1974 after your veto, was the matter of that bill returned to the legislature?

A My veto?

Q Your veto.

A Yes.

Q And did you issue a veto message at that time?

A Yes, I did.

Q Have you reviewed your veto message?

A I have read it over recently.

Q Would you briefly state for the Court your primary reasons for having vetoed the measure?

A My reasons are set forth in that message. I don't [1267] have a copy before me, but I can tell you that my primary concern was the welfare and the safety of the people of the State of Iowa.

It was my opinion at that time that if we were to allow 65-foot double bottom trucks, we would get a great increase in the number of vehicles, those vehicles traveling in our state, and most of them would be traveling across I-80, a highway that we believed at that time was congested in certain areas, and also was in need of repair; and so those reasons were set forth in that message.

Q Did the legislature take any action after receipt of your veto message?

A Not relative to that bill. They have the power, of course, to override that veto, or any veto, and they did not.

* * * *

[1268] Q How would you characterize your feelings as it relates to the increased length of the double-bottom vehicle?

* * * *

A Well, as I pointed out, I have never been anti-truck. We need trucks; we understand that. They carry our commodities and our produce, our manufactured goods, but I have always believed that my first responsibility was to the people of the State of Iowa, and in analyzing that bill that would allow for that kind of truck, I believe that we would have additional trucks that we could not really accommodate and manage, [1269] and so my feeling was at that time that I should veto that bill and disallow it.

* * * *

[1270] Q Has the matter of increasing the length of the double-bottom truck been before the Legislature in years since your veto?

A I think in one way or another it has been before the Legislature every year.

* * * *

[1272] Q Over the years, Governor, and as it relates particularly to the 55-foot single semi, you have signed into law a number of exceptions as it relates to the 55-foot semi rule or length limit, is that true?

A Yes.

Q Do you recall what some of these might have been?

A There is a border city one.

Q In connection with that one, as long as we are there, what were your considerations when you signed that into law?

A Well, I saw a need, and I saw a way to help solve that need or meet it. This was a matter where we could allow trucks to come into our state, regardless of who owned them or who drove them, and not have to break down on the other side of the river, like in Sioux City, and they were not traveling long distances so we did not have really the pavement breaking up problem.

We left it to the city council people to determine whether or not they had adequate routes or they had streets that could accommodate those vehicles. There wasn't speed [1273] involved, and we wouldn't get extra trucks, which was key in my thinking, so there were limitations, and I felt that that is something that we could do and we should do.

Q Can you think of any others? For instance, the 60-foot livestock single semi?

A That's another one.

Q What was your thinking in connection with that exception?

A Well, that has an economic impact for those that bring agricultural products through our state, into our state and out of our state, and I felt that that is something that was tolerable, and we would not get additional trucks to any great extent.

[1274] Q (By Mr. Bittner) How about the exception with respect to truck trailers manufactured in Iowa?

A Yes. I vetoed one—not truck trailers, but I vetoed the mobile home one. That's true. The legislature passed that one, I signed it. Again, it did not add to any vehicles, at least it wouldn't have added any substantially, to our roads.

* * * *

Q There is an exception which is with regard to the 65-foot automobile carrier, is that correct?

A Yes. The vehicles would not be any longer, but there would be an allowance for overhang.

Q Do you remember the reasoning in connection with that [1275] bill?

A Well, at that time the vehicles were a little longer, and bumpers were extended beyond what they had been previously, and so we felt, again, it would not bring more trucks into our state, would not create more of a hazard, because of the numbers, and that there was some reason for that overhang, so long as it did not exceed that extra five feet.

* * * *

Q Now, in recent days have you had an occasion to discuss the truck weight limitation with the Department of Transportation?

A Yes, within this last week.

Q Have you, as a result of that discussion, taken any action?

A I suggested to the Department of Transportation officials, primarily the director, that they look to see if this would not be a time when we should allow heavier weights, and he agreed, and they did bring that subject up last Monday, and the DOT has not taken positive—

let me start that and say the DOT did not complete their action on it, and so last night very late, [1276] near midnight, I used the authority that I have in declaring an emergency, which I thought was warranted, to allow the heavier weights on a temporary basis.

* * * *

[1277] Q What weight does it allow the trucks to go to?

A It allows 80,000 pounds.

Q What length does it allow the trucks to go to?

A It allows up to 58 feet.

Q Is there any particular reason for the 58-foot length limit?

A It is my understanding that we can spread the weight over a different base with a configuration that will protect our bridges, and allow for the transportation of these vehicles.

* * * *

Q Now, Governor, so far we have spent a great deal of time reviewing the exemptions and the special proclamations. Have you, by granting these exemptions, and issuing the special proclamation, reviewed the political pressure as it relates to [1278] the 65-foot double bottom issue?

A No. As a matter of fact, I think you are seeing the political pressure working. You are seeing a response to need, and a system that can be flexible enough to meet the needs in this state.

Q Governor, do you recall the preamble as it relates—that there was a preamble as it relates to the act that created the DOT?

A I think I recall it. I could not quote it.

Q Do you recall it well enough to know that it related to the purpose of creating the Department of Transportation, and what the primary purpose was?

A The primary purpose was to give us a means by which we could have an intermotor system of transportation for the best interest and welfare and safety of the people of this state.

Q Did it also take into account the needs of the nation?

A Well, I think so. I don't think we could have a transportation system that does not take into consideration the needs and the protection of our people in this state, and that which affects the rest of the nation.

MR. BITTNER: You may cross examine.

MR. LEDERER: May it please the Court, we have no questions of this witness.

* * * *

[1280] DENNIS EHLERT

resumed his testimony as follows:

DIRECT EXAMINATION (Resumed)

BY MR. HANCOCK:

* * * *

[1281] Q Yes, the current limitations. I believe the Section 321-E.28, that Mr. Bittner referred to, is the one that sets forth that exception. What is the length restriction?

A The length restriction of the mobile home itself is 67 feet 6 inches.

Q What is the limitation for the tractor unit pulling the mobile home, plus the mobile home?

A No more than 85 feet in length.

Q Could you briefly describe what type of mobile home movement is permitted under this exception?

A The movement under this exception permits only those mobile homes that have either an origin or destination in the State of Iowa.

Q So under the present statute, if I was moving a mobile home that fit within the length, height and width limitations of the statute, but I needed to move that from Chicago to Omaha and wanted to use I-80, that exception would not be available to me, is that correct?

* * * *

[1284] Q When your officers stop an over-dimensional vehicle and it would have an annual permit, do they make any indication or is there any indication on the annual permit on the number of movements that that vehicle has made within a given year?

A There are no restrictions on an annual permit for the number of trips made during the year.

* * * *

[1285] Q Under Iowa law, is a 60-foot tractor semi-trailer combination allowed for the movement of livestock?

A Yes.

Q That would exceed the AASHTO recommended standard, is that correct?

A That's correct.

* * * *

[1287] Q How long would vehicles that carry the containerized cargo be?

A They were substantially less than 55 feet. I don't know the exact length of the units.

* * * *

[1294] Q If we assumed an increase of truck traffic on Interstate 80 in the nature of 76,000 truck trips a year, what would be the effect on your department of motor vehicle enforcement?

A It would appear to me that we would show an increase of about 20,000 truck double bottom inspections over a year's period of time which, at the rate of about six percent, which we find today in truck violations, would mean about 1,200 additional violations of the size, weight, equipment, driver compliance, registration, fuel tax laws.

* * * *

[1299] Q So you had an increase of some 17,000 citations annually from '75 to '78?

A Yes, and the reason for that increase is we adopted the Federal Motor Carrier Safety Regulations, which involve equipment on the vehicle and the driver compliance requirements, log books, and so forth.

Q So with the 17,000 increase in citations, you have maintained the same staff level, and it is your testimony that with an additional 1200 estimated violations because of the movement of twin trailers, that you would need an increase in staff?

A Yes, to maintain the same level of checking vehicles.

* * * *

[1300] Q Well, in terms of what you would call the rate or the level with which they comply with the law, do you generally find that the larger regulated general commodity carriers comply with the law and are issued fewer citations than [1301] independent truckers?

A On a percentage basis, yes, I would say so.

* * * *

[1302] Q In that six percent that you arrived at, that did not try to distinguish between the larger interstate carriers versus the independent truckers. That was just a general average?

A That's a total average that we see approximately every month.

* * * *

[1321] DONALD MC LEAN,

called as a witness by the Defendants, being first duly sworn by the clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GOODWIN:

Q Would you please state your full name?
A Donald McLean.

* * * *

Q What is your position there?
A I am Director of the Highway Division. [Iowa DOT]

* * * *

[1322] Q What do your responsibilities include as Director of the Highway Division of the Iowa DOT?
A I am in overall charge of all of the highway administrative work, design of highways, construction of highways, maintenance of highways, traffic controls.

* * * *

[1324] Q Are you aware of approximately what percentage of the interstate highway system in Iowa was built with the 1975 life expectancy?
A We have, I think, about 780 miles in the entire interstate system now in Iowa, with the addition of I-380 over in eastern Iowa, and I believe between 190 and 200 miles were constructed prior to '63 or '64. As I say, that date gets a little bit difficult because of the length of the pipeline and the fact that the jobs were moving through.

* * * *

[1325] Q (By Mr. Goodwin) Mr. McLean, have you experienced any wear and deterioration on the interstate highway system?

A Obviously the first portions of the interstate constructed are now 20 years old. Twenty years, whether it be interstate or anything else in highways, is considered the normal design life of a highway, so obviously the first sections of the interstate that we constructed have approached their complete design life, or passed it, and they are to the [1326] point now where they need rehabilitation, restoration, reconstruction.

* * * *

Q Have you experienced any particular problems of deterioration of the road within the mileage of this 25 percent?

A Well, some of the early sections of the interstate at the time they were constructed, obviously the people that were in charge at that time were trying to project into the future, and their vision wasn't 20-20, and some of the designs of the original interstate were too light, were inappropriate. We have sections of the interstate highway that we—that did not provide their design life.

Q Would you identify those sections for us?

A Oh, I think that the section that has given us the most problem is probably the section of Interstate 80 out in Adair, Dallas and Madison Counties, and the section of I-35 down in Clarke County has given us problems.

[1327] Q What particular problems have you experienced in the Adair, Dallas, Madison County area?

A The original pavement that was constructed in Adair, Dallas, Madison was constructed as a rolled stone base with an asphaltic surface coat on top of it, and the design actually did not work out. The base did not drain. The base has not performed properly, and the pavement has been troublesome since it was opened to traffic almost. Within four or five years the pavement was showing signs of distress.

Q That's asphalt?

A That happens to be an asphaltic concrete section, yes.

Q Was that one of the earlier sections of interstate highway constructed?

A It was one of the earlier sections, and I think it was—and it was also one of the earlier sections of asphaltic concrete on the interstate.

Q Was it one of those that had a life expectancy to 1975?

A Yes, it would have been constructed under that period.

Q Are you doing any reconstruction or restoration work on that section of highway?

A We have done restoration work on many sections of interstate. We have done restoration work, I think, in 1965 and 1972—those dates may not be exact—on the Adair, Dallas, Madison section. We have under contract not some restoration [1328] work, with some actually pavement replacement work on a portion of it.

Q How many miles of pavement replacement work are you talking about?

A The job that we have under contract, I think, is five and a half or six miles. It is from the Dexter interchange to the Stuart interchange.

Q That's in Adair County?

A Yes.

Q Now, is that all four lanes of the interstate?

A No. We're only reconstructing the westbound lanes at this time because, obviously, you have to keep something open to serve traffic, so we're going to serve traffic with the eastbound lanes, and reconstruct the westbound lanes.

Q Do you know what the cost of that reconstruction will be?

A The total contract was about $3 million.

Q For how many miles of highway?

A Five and a half or six miles is my recollection.

Q This is only on two of the four lanes?

A That's right.

Q What are you going to do with the traffic during the reconstruction period?

A We will build cross-overs and carry two-way traffic on the eastbound lanes.

[1329] Q Will that have any effect on the wear of the eastbound lanes?

A Well, obviously it doubles the loading—doubles the traffic loading on those lanes, and we will be doing some special repair work to it before we transfer that traffic, but it will certainly accelerate its problems.

* * * *

[1332] Q Does a highway, depending on the design, have a set number of axle passes that it can withstand until it wears out?

A Yes. I don't think—it is certainly not highway definitive that you can say, "This passage, this will take place, and the next passage will fail the pavement." Failures happen in fatigue, and the general level of service will decline in a given rate, and at about the number of axle loads that would be critical, why, the pavement is no longer offering acceptable service.

* * * *

Q So is it correct to equate rigid pavement type with a Portland Concrete pavement, is that correct?

A That's correct, Portland Cement concrete.

[1333] Q (By Mr. Goodwin) And then a flexible type pavement with what, asphalt?

A Asphaltic concrete, yes.

* * * *

[1337] Q If you have an asphalt highway with a structural No. 6 in the state of Iowa, where would you anticipate finding that type of highway?

A On the primary road system. It would be—that [1338] would be low for an interstate. A structural number of 6 would be very, very suspect on an interstate highway.

Q Would it be the lower range of interstate?

A It would be the upper range of a normal medium duty primary.

Q How about a structural No. 3? What type of road would you anticipate?

A That would be maybe our stub roads going into some of our small communities. Maybe some of the major farm-to-market roads would have a structural number of 3.

* * * *

[1341] Q Looking at this same table, can you pick out a ratio between an 18,000-pound truck axle, and the equivalent number of automobiles?

A That's often been, at various times, quoted; and, of course, if you take that same first column, you will see that the 18,000-pound axle has an effect of one, and a 2,000-pound axle, presumably that of an automobile, has an effect [1342] of, what, 2/10,000ths, so that would tell you that one is 5,000 times the other, so one car axle is— or 5,000 car axles have about the same wear factor as one maximum loaded truck axle.

* * * *

[1345] Q Then rounding that to three axles, that would be equivalent to 7,500 vehicles?

A It would be the same as 7,500 cars passing over the pavement.

Q And if we anticipate an addition of 75,000 additional twin trailers—

MR. JOHN VARDA: I'm going to object.

Q (By Mr. Goodwin) —would that have the equivalency of 75,000 times 7,500, to put it in terms of vehicles?

MR. JOHN VARDA: Objection. Counsel has taken that completely out of context. First of all, he has told us that SN-3 is the type of design you're going to have on stub roads. It would not even—At SN-6 would be the type that you would have on an interstate highway, and we have leaped forward and discussed the 75,000 trips that had been projected for the interstate system to make a comparison to two types of highways that are not—

THE COURT: I don't get the relationship under the very thing you are saying, Mr. Goodwin. Why are we dealing with SN-3's?

MR. GOODWIN: Your Honor, just for explanation [1346] purposes, I was trying to determine the relationship of axles, cars and actual wear.

Q (By Mr. Goodwin) Mr. McLean, if you are looking at SN-6, would that be within the lower range of an interstate highway?

A It would be marginally at the lower range of the interstate.

THE COURT: What is the structural number for the interstate as constructed?

THE WITNESS: We vary from section to section, obviously, because the time intervals during which it has been designed has varied. The first section, this philosophy—this rationale didn't even exist, but most of the interstates would be in the 8 to 9 area.

Q (By Mr. Goodwin) Mr. McLean, looking at Defendant's Exhibit 533, what is the highest structural number that table provides?

A Six.

Q Did the AASHTO study have a higher structural number than 6?

A The formulas provide for it, but the tables do not.

* * * *

[1348] Q Now, if you have a full depth asphalt pavement, does that act as concrete, or as a rigid-type pavement?

A No, that is still a flexible pavement and will have all the characteristics of a flexible pavement in the way it will react to load, but it doesn't have the moisture susceptibility that our rolled stone bases do.

* * * *

Q Does full-depth asphalt have the same equivalent axle loads as concrete would?

A No, no. The equivalencies as affect your pavement are two different tables, and there are slight differences. They are not major differences, but they are slight differences.

* * * *

[1350] Now, there has been some discussion of level of service. First of all, what do you mean by level of service?

A Level of service today is a composite measure that has been accepted in recent years that tells you essentially—it gives you a numerical relationship for the amount of inconvenience or the amount of irritation that may be connected with using a highway at a specific time, so far as concentration and traffic interference. A high level of service is A. A low level of service is F.

[1351] Q Would level of service have any applicability in designing rural highways, including interstates, in Iowa?

A Not in Iowa. Our heavily traveled rural section of the interstate is carrying 20,000 vehicles a day. Obviously, they are furnishing level of service A. We don't have that much traffic that level of service becomes a design criteria.

When you start to compromise level of service, it is because the demands of the job are so great that you have to. Iowa is a very level state. Most of our alignments are not determined by terrain, by avoiding mountains or heavy cuts, or heavy fills. Our grades are gentle. Our terrain is gentle.

* * * *

Q In the 1960's, did you anticipate a certain percentage of commercial vehicles that would use the interstate highway system?

A The original estimates of loading on the interstate were, of course, made back in '55 and '56 and revised from time to time as we gained experience with the interstate. While the [1352] total traffic in those original estimates was pretty good—I mean if we were anticipating that there was going to be 20,000 vehicles on the road in 1975, there was about 20,000, or if we were anticipating 15, we ended up with about 15,000. Our traffic growth projections were about right, but traffic mix projections were not good at all. The normal primary road at the time that the interstate started—the normal primary road was carrying something like 8, 9, 10 percent commercial vehicles, and the traffic projections on the interstate anticipated that that relative ratio was going to stay about the same, or even get less on the commercial vehicles side and, actually, of course, we all know what has happened to the railroad and transportation systems in general, and the commercial vehicle mix in our traffic stream is, much, much higher.

Q What percentage is that mix now?

A I can't give you exact numbers, but it is running between 25 and 30 percent for the interstate system.

Q It was originally anticipated at 8, 9, 10 percent?

A Eight, 9, 10.

Q What is the total volume of traffic per day on Interstate 80?

A Well, that varies, of course, from section to section. I suppose—When I think of Interstate 80 in our rural traffic, I think of something in the 15, 16 vehicle a day range. Over [1353] around Iowa City it is probably up around 18,000. As you get near Davenport, Iowa City to Cedar Rapids, that area, as you get closer to Des Moines, as you get over in western Iowa, you fall off to 12,000, but if you are thinking of Interstate 80 across the state, at least as I think of it, I think around 15, 16,000 is a good average traffic flow.

Q Would the addition of 75,000 more trucks have any effect on traffic as you would perceive it?

MR. JOHN VARDA: I'm going to object. He has 75,000 as an annual projection, and he has got daily average traffic. I think we should get together on comparative figures.

Q (By Mr. Goodwin) Let's talk about daily traffic. I think 1975 DOT studies said 206 vehicles per day. Increase that by 10 or 12 percent so we will be talking about 228 to 230 vehicles per day. Would that have any effect on the traffic on Interstate 80 in your perception?

A Obviously, the vehicles you are adding are heavy vehicles, are in the heavy range, so it would, so far as pavement life was concerned, yes.

Q Why would that be?

A Well, as I see it, when I think of Interstate 80 across Iowa, I think of something like 15, 16,000 vehicles a day. Twenty percent of that approximately is commercial vehicles, so of that 15, 16,000, we've got 4,000 commercial vehicles. Now, that two-thirds—I am speaking in general [1354] figures, because this is not—I'm not a traffic statistician, but that two-thirds to three-fourths of the commercial traffic stream is three-axle semis or more. It is big vehicles. We're talking something like 3,000 heavy commercial vehicles a day in that traffic stream, and the figures you are talking about would be a 7 or 8 percent increase in that heavy vehicle traffic stream. That's significant.

Q Primarily in reference to wear and deterioration?

A Primarily in reference to pavement wear. I don't suppose that the average person driving the highway from a concentration standpoint would be aware of them.

THE COURT: I don't get your percentage, Mr. McLean. Three thousand heavy trucks, and they're adding 230. I don't get your percentage.

THE WITNESS: Wouldn't that be about 7 percent—6 percent? Ten percent would be 300. Five percent would be 150, so somewhere around 6, 7 percent.

MR. JOHN VARDA: I still have a problem, Your Honor. This is the prior objection, and I was going to bring it up. The 230,000 that you have projected, we've got the added vehicles projected on all of the interstate system. The 163 projected on I-80, which we carried out based on Mr. Nimmo's projections to approximately 200—

THE COURT: I think that's correct. We should be referencing approximately 200 as opposed to 230.

[1355] MR. JOHN VARDA: It's not that big a difference, but it should be clarified.

THE COURT: I appreciate that. Thank you.

MR. GOODWIN: I appreciate the clarification.

Q (By Mr. Goodwin) Let's reference an approximate increase of 200.

A Sure. That would cut your percentage down 6 percent, something like that.

Q Does that change your perception on the wear and deterioration of the highways?

A That is still a substantial increase. Six percent increase in heavy vehicles is a substantial increase.

* * * *

[1356] Q So what significance would the additional five feet of truck have in relation to the wear and deterioration of the road?

A Well, of course, the additional five feet of truck will increase the weight.

Q Why is that?

A Well, we're going to put something in the five feet, I assume. Now, admittedly, the maximum weight won't go up. The total weight is changing. It will still be 72,380, but the axle loading will change when we put something in that additional cubage, and, as axles go up, their effect on the highway goes up.

* * * *

A Traditionally, the Federal aid programs have provided financing for the construction of highways. Now, with the last two Federal Aid Acts, they have acknowledged that the states, in general, are getting into trouble with maintenance of the interstate. There has never been any Federal money for maintenance. However, the last two Federal Aid Acts have [1357] included what they call 3-R money; resurfacing, reconstruction and restoration, I think, is what the R's stand for—for the interstate, and that those Federal dollars then may be matched by the state to restore completed sections of the interstate, and, of course, that's the kind of money that we are using for the restoration work that you brought up out in Adair County.

Q Have you made a determination of the amount of money that the Iowa Department of Transportation would need to restore the existing interstate system to its original condition?

A When the Federal government was considering this legislation, they asked for estimates from the states of what they visualized or what they estimated to be their 20-year restoration needs on the interstate, and all the states furnished those figures to the Federal government, and if I remember right—my figures may be—they are in the right ball park—the Federal government then offered testimony that the restoration needs on the interstate were $2.7 billion, and that they were increasing at the rate of—I think it was $950 million per year, so there was a backlog of 2.7 and an accumulation at the rate of 950 million a year.

That was a 1977 study, and the data that we submitted to that study said our 20-year rehabilitation needs were going to be 350 million, so that's where we stood in 1977.

Q Now, figuring that $350 million, did Iowa foresee a backlog as there was nationally?

[1358] A Yes, we have a backlog. We have uncompleted restoration needs on the system right now; much more than we can finance.

Q What dollar amount are you talking about, backlog?

A Well, I don't know that I could put a figure on it. If you take our $350 million over a 20-year period, we should be spending then something on the average of $17 million a year. Right now our Federal funds that we have available to us, I think, for this year are running 2.8 million. We match those with 25 percent state money, which gives you about 3½ million then to spend, 3½ million to accomplish 17 million worth of restoration work.

Q Would it be correct then to say that each year you are falling behind?

A We are falling behind.

Q By 14 million?

A By something in that neighborhood certainly. Our rates of completion on the interstate weren't uniform. Obviously, our aging isn't uniform, but, yes, it is in that neighborhood.

Q You indicated taking some money from the primary road system and using it on the interstate system.

A Well, any of the Federal funds that come to you—to the state, almost any of the Federal funds requires some matching, and, of course, the matching money that we have to [1359] put up, the restoration work on the interstate is 75-25, so we have to put 25 percent up out of state money. That's the primary road funds.

* * * *

[1361] Q (By Mr. Goodwin) But your only recapitalizing that rate?

A Less than one.

Q Are you falling behind then on the entire primary road system?

A Oh, yes.

Q Now, in reference to falling behind $14 million a year, is that only the interstate system?

A That's the interstate. That's the only—So far as primary road function is concerned, that's the only place that there has been Federal 3-R funds specifically designated.

Q Noting that you are falling behind on the restoration, maintenance of the interstate system, what effect would you see in the allowance of additional larger twin trailers on the interstate system?

A Well, any additional usage of the system will increase the rate of deterioration.

* * * *

[1365] CROSS EXAMINATION

BY MR. VARDA:

* * * *

[1366] Q (By Mr. John Varda) As I understood it, you were saying that there were only slight differences between SN-8 and 9 categories on the one hand and rigid pavement equivalent axle loads on the other hand?

A The differences are not great, that's right.

* * * *

[1373] Q The equivalent axle loads are used to measure the consumption of the highway, are they not?

A Yes.

Q And are you saying that a 1.0 equivalent axle load on a rigid pavement means something different, in terms of consumption of the highway, than a 1.0 equivalent axle load on a flexible pavement?

A No. That is my statement. They are exactly the same, but the effects of a given axle on the pavement from the results of the actual test are somewhat different, depending on pavement type and structural number.

Q And it was the determination of the AASHTO study we would have equivalencies, based upon those numbers, between flexible and rigid pavement, despite some differences in what actually happened?

A That's right.

* * * *

[1381] Q So the conclusion we should reach is that on your interstate system, which is basically 10-inch thick concrete, that for any given weight, the semis produce significantly more road wear than would the twins?

A That's what this would indicate.

Q That's your conclusion, is that correct?

A Yes.

Q Okay. Now, if we had twins predominantly on the interstate system, which some 90.65 percent of the mileage is concrete and the remainder is asphalt and some deep-strength asphaltic concrete, have you made a calculation to determine which vehicle would have the greater effect on the road consumption or road wear?

A I have not made such a calculation.

Q Now, with the relatively small amount of—Let's see if we can do this in qualitative terms. With that very large percentage of the interstate highway system in concrete or asphalt on concrete, which is treated as a rigid pavement, isn't [1382] it true that the differences you see as between semis and twins, favoring the twins in terms of production of less road wear, that operation on the system—on the concrete portion of the system would more than offset the differences in terms of wear, whatever they may be, between the twins and the semis on the asphalt under the flexible pavement formula?

A From these figures, the effect on the concrete would be more significant.

Q Okay. But isn't—

A And would control, yes.

Q So the net effect would be that operation of twins on the interstate would produce less road wear than the operation of semis of the same weight?

A On the concrete portion, that's correct.

Q I'm talking about—Let's take this all together. Let's put the concrete portion—

A Well, the concrete portion is the predominant portion.

Q Okay. But can you say—and just judging from the figures and your experience—that the net effect of operating the respective vehicles over the interstate system would be less road wear produced by the twins than by the semis?

A Based on the figures that we have here, that would be my judgment.

* * * *

[1385] Q —and you see a weight there for semis and a weight there for twins. My recollection is that those were average weights that your department determined to be appropriate for the comparison. Is it correct for us to assume then with the rigid pavement formula being appropriate for the calculation, that the introduction of 65-foot twins in the State of Iowa would result in less road wear as between the two types of vehicles, favoring the twins in terms of road wear?

A If those weight comparisons are right, that would appear to be a logical conclusion.

Q Now, if it turned out that the average weight on CF's twins was on the order of 65,558 pounds rather than 65,000 pounds, would that make any significant difference?

A It would make some, but it wouldn't appear to be significant.

Q Okay. That's the same as in your deposition when you were asked about the differences in the vehicle weight between 60-foot twin trailer vehicles and 65-foot vehicles where the difference in weight is 100 to 700 pounds, there would [1386] be no significant difference in the effect of that weight difference on road wear?

A Weights of that magnitude, I don't think would be identifiable.

Q Okay. So the 558 pounds then would not make any significant difference in the conclusion that we just reached concerning relative road wear by 65-foot twins and 55-foot semis based upon the Iowa DOT study and the average weight of CF's twins?

A No, those magnitudes are not going to affect it.

* * * *

[1381] Q Based upon the discussion we have just gone through with respect to cubing out and weighing out, would it not be a fair statement that, to the extent there would be added weight on 65-foot twins, as opposed to 60-twins in operation in the State of Iowa, that that weight would not result in [1382] weights as high as weights generally experienced with five-axle semi-tractors operated by weight constrained carriers?

A I think that's a reasonable statement.

Q Is it a fair statement that because of the use of semis by weight constrained carriers and the use of twins by cube constrained carriers, we would have many more semis which are loaded to the maximum gross than we would have twins?

A That would appear to be a reasonable conclusion.

[1383] Q (By Mr. John Varda) And then when we look at Exhibit 532, it might be equally as appropriate to compare semis and twins, looking at the 1.42 equivalent axle loads for the twins at 65,000 pounds and the 3.06 equivalent axle loads for the semis at 73,280 pounds. That would be an appropriate comparison, would it not?

A Those would be the equivalencies reflected in this, yes.

Q Since we now know that the semis would tend to be closer to the 5-axle semis, which are reflected in this comparison—would tend to be closer to the maximum gross weight than would the twins, it might be appropriate to make a comparison between the twins at 65,000 pounds and the semis at 73,280 pounds?

A Insofar as the semis are weight constrained, I think that's a legitimate comparison.

Q Based on all of these observations, those that you made this morning with respect to comparison of twins and semis and those which you have just made in comparing cube constrained and weight constrained carriers, is it proper for us to conclude from your testimony that your concern is not with the relative influence on road wear of the respective vehicles, comparing semis and twins, but the problem of additional vehicles operating on roads in the State of Iowa as a result of authorizing 65-foot twins?

* * * *

[1384] Q We have now seen that operating twins in lieu of semis would have a more favorable impact on the interstate system, and under those circumstances your problem and your concern is to avoid additional vehicles of either type?

A If the choice is between twins and semis, the twins would appear to do less damage.

* * * *

Q Is there some desirability in terms of road wear to having vehicles dispersed on a four-lane facility as opposed to operating on a two-lane facility?

A Of course, with equal number of vehicles on a four-lane facility, you have less loading per lane. In theory, your pavement should perform better.

* * * *

[1387] Q Would you conclude, based upon those observations of the geometrics of the interstate system in Iowa—they are of sufficient design to accommodate 65-foot twins?

A Yes, I believe they are.

* * * *

[1393] Q (By Mr. John Varda) Now, with respect to the matter of rehabilitation of the interstate facility, you gave a certain amount of testimony related to portions of the system that were completed before 1963 and 1964, and indicated approximately 190 to 200 miles were completed, or 25 percent of the system. In that connection, is it not true that, to the extent that you are facing needs for rehabilitation, basically other states are in the same position?

A Yes. I think that's true.

Q There is nothing unique to the State of Iowa about the problem of having to rehabilitate its interstate facilities at this point in time?

A Not that I am aware of.

Q Do you recall discussing the cost of maintenance on the interstate facility and the discussion that you were living on borrowed time with the facility in its present condition?

A Well, I think we're deferring a good deal of rehabilitative work that we should be doing, and presumably we will compound our problem as we go downstream from here.

Q Isn't the problem that you have with respect to the interstate facility at the present time the result of the fact that the State of Iowa has chosen to distribute revenues [1394] in a 45 percent distribution to cities and counties for maintenance of their roads?

A I don't know whether it's a result of that, but certainly—I don't recall the percentages either, but I get your meaning. Yes, a major portion of our road use tax revenues, state road use tax revenues, go to the cities and counties.

Q So in the 1975 Iowa study where it indicates that the addition of the interstate vehicles would actually produce more revenues to the State of Iowa than cost, in terms of road wear on the interstate facility, your problem arises out of the fact that, in terms of insufficient funds, that the monies have been distributed for county and city facilities, rather than retained for the interstate system, is that correct?

A That's certainly a portion of the problem.

* * * *

[1395] Q But as a portion of the system, the interstate is allocated less revenue for maintenance purposes than it produces?

A That's true, yes.

* * * *

[1410] Q You indicated again your concern about maintenance on the primary road system. I'm wondering, sir, referring to Page 3 of Exhibit 2, the 1975 study—there is the following statement: "Based on available information and a detailed analysis of what has taken place in other states, it was estimated that total traffic volumes on the primary system, other than the interstate, would be reduced by approximately two percent by 1980." In view of that statement, what I am wondering is wouldn't the introduction of twins tend to help your road wear problem?

A The two percent reduction on the primary system on trucks would certainly help the road wear on the primary.

* * * *

[1411] JERRY LEE HALL,

called as a witness by the Defendants, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PAFF:

* * * *

[1418] Q Now, with regard to the structural No. 3 and structural No. 6, why were those chosen? [Exhibit 532]

A The structural number of 6 is the highest value listed in the AASHTO data, and represents probably the high end of a primary highway in Iowa. It represents the low end of the structural number on the interstate highway in Iowa. The structural number of 3, for example, would represent the high end of a secondary road in Iowa, and the low end of a primary road in Iowa. So the structural No. 6 and structural No. 3 were selected to give a representative feel for what the relative damage would be among the roadways in the State of Iowa.

[1419] Q Now, with regard to those figures, were those supplied to you by the Department of Transportation, or did you obtain those in discussions from the Department of Transportation?

A These structural numbers were indicated to me by people in the Department of Transportation that would be representative of the roadways in Iowa in the way that I just mentioned.

Q Now, with regard to anything higher than a structural number of 6, how would one go about forming a calculation for that?

A If one had a structural number larger than 6, one would have to extrapolate the data from the AASHTO table, and anyone that's done engineering experiments knows it's very dangerous to perform extrapolation procedures. You are estimating damage in a realm where no experiments were available, and that can lead to dangerous conclusions; so I chose not to make any extrapolations.

* * * *

[1420] Q (By Mr. Paff) With regard to your display of data on this exhibit [Exhibit 532], were you able to conclude anything regarding road wear?

A Yes. This exhibit clearly shows that, depending on the type of pavement that you have, the road damage can be significantly different for the twins, as compared to the semis.

Q And what is that indication?

A Well, for example, if we take concrete, first of all, at 10 inches thick, and use the 73,280 pounds gross vehicle weight, it indicates that the semis have an equivalent axle loading per semi of about 3.06 units, as compared to twin, which has about two and a half units; so on the rigid pavement, the twin would be expected to have somewhat less of a damage on that type of pavement.

By contrast, if we take the asphalt type pavement, and we compare the damage factors from the twins, compared to the semis for the same loading, we see that the situation is reversed, and it's not an equal reversal. That is, it's a much more dramatic reversal. In other words, the twins on asphalt do more damage by proportion than semis, as compared to the concrete, for example.

Q Now, with regard to Defendants' Exhibit 523, were you able to relate your conclusions with regard to Defendants' [1421] Exhibit 532 and Defendants' Exhibit 523?

A Well, on Exhibit 523 we have a breakdown of the mileages that were provided to me by the Department of Transportation for the primary and interstate highways in this state; and on that exhibit, it shows the relative proportion as well as by percentage of each type of construction. For example, on the interstate, the asphalt portion of the interstate is about 9.35 percent, so on that 9 percent of the interstate, any twin operating at a gross vehicle weight of 73,280 pounds is going to have a damage factor of 2.55, compared to the semi of the same load of 1.75.

MR. JOHN VARDA: Your Honor, I'm going to object. This testimony is not competent. Even this witness admits the SN-6 is the low end for the interstate. The previous witness indicated that the interstate was mostly SN-8 or 9. We went through a whole series of questions.

MR. PAFF: We will correct that, Your Honor.

Q (By Mr. Paff) With regard to the—Assuming you made a calculation with regard to the extrapolation you talked about, would the numbers vary significantly between the difference we see under SN-6?

MR. JOHN VARDA: I'm going to object. I don't think this witness has been qualified to identify how you make an extrapolation. He has not been qualified to know whether that's the recommended procedure in AASHTO. He has not [1422] been qualified in looking at the full AASHTO study as to whether there is a procedure recommended, and it's speculating on the results of an equation.

[1423] THE COURT: I think it is marginal whether or not Mr. Hall has qualified himself for this computation in view of his testimony, but I will again take it subject to the objection.

Q (By Mr. Paff) Did you make such a computation, sir?

A I did not make such a computation for structural numbers of 8 to 9, but it could be done by extrapolation of the data.

* * * *

[1463] Q And is it a correct assessment that on your summary of consulting services for 1968 to 1977, that some 87 of 104 were either in matters in which you were employed by attorneys, insurance companies related to claims, or by Mr. Peters or Mr. Wandling?

A That may be. I haven't added them all up.

Q What is your principal activity as a consultant?

A The principal activity as a consultant is in two different areas. One is in measurements and instrumentation and obtaining data for people, and the other is in examinations of fires, explosions and damage caused by malfunctions in apparatus or components.

Q What percentage of your time is devoted to the consulting activities which you listed for the year 1977, for example?

A Oh, I have no idea what percentage of my time I would have spent in that year.

Q You were employed on some 34 different litigation matters during that year. Would that help your recollection?

A Well, I don't keep an exact count from year to year as to how many hours I spend on research and how many on [1464] teaching and how many on my professional engineering activities.

Q How many of the claims and litigation matters on which you have been employed by insurance companies or attorneys have involved analysis of road wear and relative road wear between different types of vehicles.

A None.

Q Does this proceeding represent your first venture into the field of road wear analysis?

A Yes, it does.

* * * *

[1489] ROBERT L. CARSTENS,

called as a witness by the Defendants, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GOODWIN:

* * * *

Q What is your occupation?

A I'm a Professor of Civil Engineering, employed by Iowa State University.

* * * *

[1493] Q First of all, what is meant by "conflicts of traffic"? What do you mean?

A Well, a conflict can have more than one definition. In its larger and more general sense, a conflict occurs when there is a possibility of two vehicles—and we're speaking in the context of highway transportation—where there exists the possibility that the two vehicles might have the desire to occupy a roadway space at the same time. These, of course, are the situations that give rise to accidents; and, in point of fact, when this occurs—two vehicles attempting to occupy the same roadway space at the same time—I think that's the definition that's most appropriate for the testimony that I am about to give. Although there are stylized kinds of studies that deal with traffic conflicts, the most commonly accepted one [1494] of these identifies a conflict specifically as some evasive maneuver taken by one vehicle to avoid this conflict situation, and this is exemplified in this type of study by either a change in lanes by the vehicle taking the evasive action, or brake light activation, indicating there was a change in speed, reduction in speed, perhaps to zero, perhaps to a stop.

* * * *

[1496] Q Were you asked by the Department of Transportation to conduct a conflict study in this litigation?

A Well, this is the way it evolves, although actually I guess I was asked to look at the potential for an increase in accidents that would result if there were an increase in vehicle lengths from 60 foot to 65 foot, and one method—the method that we selected to do that was to look at conflict situations and make some physical measurements and make a study, which although it was not conflict study, did deal with the occurrence of conflicts given—and the effect of that as a result of changes in vehicle lengths.

Q What then did your study pertain to?

A It pertains specifically to those maneuvers that take place at intersections wherein a—one traffic stream, which would include combination vehicles, would make crossings at right angles, or essentially right angles of another, crossing another traffic stream.

* * * *

[1497] Q Is there any relationship between daylight hours or nighttime in intersection collisions?

A The data in this whole area are difficult to come by, so I am speaking partly from experience and partly by interpreting the data that have been published by the Office of Safety Programs of the DOT. The answer is yes. The right-angle collision phenomena is one that occurs disproportionately [1498] at night, and this is a function of the visibility of the trailer unit, which normally is relatively poor.

Q Did your study then relate to the phenomena of right-angle collisions as related to 65-foot twin trailers as compared to 60-foot twin trailers?

A That is correct.

* * * *

[1499] * * * Therefore, we elected to do a field survey of admittedly limited scope that would identify the acceleration characteristics that occurred in actual practice at an actual intersection situation, an intersection situation that might or might not be related to interstate travel.

* * * *

[1503] Q What do you mean by "combination vehicle"?

A I'm talking in this case about a truck tractor with a semitrailer, because at this location there were no double-bottom units. We encountered only semitrailer units, and of all types; furniture vans, cargo vans, grain trailers, flatbeds [1504] equipment trailers, all types.

Q Now, if you are observing 55-foot semis, or observing—Were you observing other than 55-foot semis too?

A Well, obviously we couldn't stop them and measure them. There may have been some that were 52 foot, which would tend to make—which is not terribly uncommon in Iowa, but I would say that better than 95 percent, or perhaps all of them, were 55 foot. They all appeared to be, and we have assumed them all to be 55 foot.

Q Then for the purposes of this study relating to 65-foot twin trailers, how did you relate those semis ultimately to twin trailers?

A Okay. Given the 55-foot length, and given the distance that a 55-foot unit encroached upon the opposing traffic lanes, this led then to the calculation of a rate of acceleration, average rate of acceleration, because we had to assume that acceleration was uniform. That is that the increase in speed was uniform as a crossing was taking place. Then using that rate of acceleration, one could calculate the period of encroachment for a vehicle that was just five foot longer, or 60 foot, and one could calculate, given the same average rate of acceleration, the encroachment time for a vehicle that would be 10 foot longer, or 65 foot in total length.

Q Now, in your report, Exhibit 538, at Pages 1 and 2, you indicate Type I, Type II, and Type III maneuvers.

[1505] A Yes. That's correct.

Q Did you prepare for us a graph or diagram that would illustrate those three different type maneuvers?

A Yes, I did.

MR. GOODWIN: May I approach the witness, Your Honor?

THE COURT: You may.

MR. GOODWIN: If you leave it back here, can the Court see this?

THE COURT: I can see it.

Q (By Mr. Goodwin) I direct your attention, Mr. Carstens, to Defendants' Exhibit 539. Can you see that?

A Yes.

Q Can you explain what that illustrates?

A Well, that shows graphically what is rather difficult to envision in words when I talked about Type I, Type II, and Type III movements or maneuvers. Those are the three different types of maneuvers that were identified as part of this study, and which the conflict involves traffic streams crossing at right angles or at something very nearly right angles.

Q So that I get a better understanding of this diagram pictorially, where would the exit or entrance ramps on the interstate be represented?

THE WITNESS: May I approach the chart?

THE COURT: You may.

THE WITNESS: I should add that although the scale [1506] here is not significant, this was drawn to portray to scale the north terminal; that is, this is that Bird Street Avenue, and the exit ramp from Interstates 35 and 80 come in 100 or 200 feet back to the east, and the exit ramp is 100 or 200 feet to the west, and in fact this is oriented so that north is up, although this maneuver—at least these maneuvers can occur at thousands of such locations. This was taken at that—this was drawn to indicate that particular location. It happens that the side streets are four lanes, and Second Avenue is four lanes with a median.

The Type I maneuvers are those where the crossing is at right angles and completely across, so that in point of fact, the conflict occurs with four traffic lanes, although the encroachment time was measured only for the crossing of the nearest two traffic lanes; and as indicated in Table II in the report, the assumption was made that on the average—and this was an average—the movement initiated from a stop line or a stopped position that was 10 feet back from the edge of the nearest traffic lane. In point of fact, most of these—all but one of these—maneuvers were from east to west. There was one, as I recall, from west to east; but it's a crossing of all four lanes directly across at right angles.

Q Would these maneuvers be made by traffic either coming off of the interstate highway or going onto the interstate highway?

[1507] A Yes, yes; either one.

The Type II maneuver was one where a left turn was made from Second Avenue to the one of the side streets. One of those were from the south to the west, again approaching the entrance ramp to Interstate 35 and 80, although there were a few that went this direction. Incidentally, the same type of maneuvers occur with opposite directions equivalent on the south interchange or the south path of the interchange at Second Avenue and the two interstates. But the Type II maneuver is a left turn from Second Avenue onto the side street. The encroachment time was taken during the period of time that these two lanes were occupied for this particular maneuver—or these two lanes were occupied for the particular movement to the east.

The Type III maneuver or movement was the left turn onto Second Avenue from the side street, as indicated by the blue line. The stopped position in that case was taken as 10 feet back from the point where encroahment began, so there was actually a ten-foot run-up during which time the vehicle was accelerating before its encroachment began.

I should have added that there was a 33-foot run-up from a stopped position before the Type II maneuver began to encroach upon these two traffic lanes for the example going north to west—the Type II maneuver, left turn onto Second Avenue—[1508] or Type III, rather. The Type II was a left turn from Second Avenue; and Type I was straight across.

Q Were there any of those maneuvers that typically had the vehicle moving at low rates of speed rather than stopped?

A The greatest range of accelerations and the encroachment times were associated with the Type III maneuver, because although we measured the time of encroachment in two lanes, there are actually conflicts generated in all cases in three lanes, because this vehicle has to—and the more difficult maneuver really is the merge that has to take place in this lane for the movement in the direction that I'm indicating. That is in the nearest lane in the far two lanes of traffic.

Q Now, your study looks at the conflict in just the first two lanes being crossed?

A The encroachment time was measured there. We did not count or identify conflicts in the third lane, but very obviously there were conflicts generated there, because—and this led to a great deal of erratic readings, in terms of the time that it took to effect that particular maneuver, and some of those were very long.

Q Now, did you compile the times then for these three different types of maneuvers?

A Yes, I did.

Q Did you put that on a table within your report, Defendants' Exhibit 538?

* * * *

[1515] Q Is it proper to attribute the same acceleration rate to all these vehicles?

A I can see nothing wrong with that. The weight characteristics, the weight-horsepower ratios, the driver [1516] characteristics would seem to be the same. * * *

* * * *

[1527] Q What conclusion did you then reach as a result of this study and your report?

A My conclusion was that an inescapable result of [1528] increase in vehicle length is an expectation of an increase in accidents because of the types of maneuvers that they have to make in entering and crossing and diverging from a traffic stream, and the fact that the amount of exposure, the amount of encroachment upon opposing traffic lanes is of necessity a direct function of the length of that vehicle.

Q Now, would the vehicles going to and from the interstate system present this type of situation?

A At every trip origin, every trip destination, every intermediate stop for picking up trailers, reconfiguring loads, change of drivers, eating, refueling—every intermediate stop would generate this type of a situation.

* * * *

[1530] CROSS EXAMINATION

BY MR. JOHN VARDA:

* * * *

[1537] THE COURT: Let's get this three in a million straight. Tell me in layman's language what that means. Is it that for every million vehicles that goes through there, there is not going to be a suitable gap in three instances?

THE WITNESS: It says that if you have a stream of anything, vehicles in this case, that occurs with a frequency of 2,000 per hour, and are seeking a gap in that stream as long as 22.89 seconds, that one of those gaps will occur every third of a million such passage of vehicles, which would be several hours. In other words, it would be several hours before a gap of that length, 22.89 seconds, would occur, given that volume of traffic in the traffic stream.

Q (By Mr. John Varda) So, in other words, whether it's a 60-foot vehicle or whether it's a 65-foot vehicle, the presentation of a suitable gap would be in the range of three in one million?

A The probability of occurrence of a gap of 22.89 seconds, which we have associated with the 60-foot vehicle, specifically, is three in one million.

THE COURT: In other words, converting that to actual facts—or not actual facts, but taking that calculation, that's [1538] the same thing as saying that a truck or a vehicle would have to sit there until 330,000 went by before he found a gap he could get into?

THE WITNESS: That's correct. Yes, Your Honor.

Q (By Mr. John Varda) So your measurement, when you're looking at 38 percent on Table 5, that's not really a measurement of what's going on in this situation, is it?

A I believe it is, yes, because, as I started to say before, the reaction, in this case, of course, since those gaps are not going to occur without a wait of several hours, is for the driver then to make a gap.

Q That's true, based on that measure, with a 60-foot vehicle or a 65-foot vehicle or a 55-foot semi?

A That's true; but, again, there are different probabilities associated with a number of conflicts that will arise as a result of that.

THE COURT: Let's take the 250 figure then. How long will a vehicle have to sit there before he can get into the stream of traffic, for 250?

THE WITNESS: Again for the 22.89 seconds?

THE COURT: Yes.

THE WITNESS: There would be 20 percent of the gap that would be suitable, which would mean that in an hour of 2,000 vehicles, there would be 400 such gaps—250 per hour, there would be 400 such gaps in that stream.

[1539] THE COURT: Let's put it in relation to millions again.

THE WITNESS: There would be 200,000 per million.

THE COURT: 200,000 per million gaps there, as opposed to three in the 2,000 traffic?

THE WITNESS: Yes, sir. That's correct, Your Honor.

* * * *

[1540] THE COURT: Then instead of 200,000 gaps —if it happens 250, it would be reduced by two percent, is that right?

THE WITNESS: It would be reduced by six percent.

THE COURT: Yes, by six percent.

THE WITNESS: Yes.

THE COURT: Which would be 12,000 gaps?

THE WITNESS: The reduction would be out of that million again?

THE COURT: No. You said there was 200,000 gaps in an hour if the traffic was 250.

THE WITNESS: Yes.

THE COURT: All right. Now, as far as 65's are concerned, there would be six percent less gaps?

THE WITNESS: That's correct.

THE COURT: Which would be 12,000?

THE WITNESS: That's correct.

THE COURT: There would be 188,000 gaps in an hour for the 65-foot to get into?

[1541] THE WITNESS: 188,000 gaps out of a million such gaps.

THE COURT: All right. I have got it straightened out.

* * * *

[1551] Q Has the procedure that you have used been published and described by you in any manual or publications in the field of traffic or transportation engineering, or highway safety engineering, or the like?

A No. It may or may not be in the future, but we haven't had time to move that quickly yet.

Q So this is really the first outing for the procedure you used?

A Yes.

* * * *

[1554] Q And the GM manual would require that the counting conflict surveys be done only on Tuesdays, Wednesdays and Thursdays, is that correct?

A That's correct.

Q I believe April 6th was a Friday?

A I do not know.

Q Do you know whether you controlled your studies for the days of the week?

A There was no attempt to exclude Friday or Monday.

* * * *

[1561] THE COURT: Doctor, how could length be a function in those accidents unless it just involved the last five feet of the truck—or trailer—last five feet of the trailer?

THE WITNESS: Well, the middle of the trailer is five foot longer, not the—that's the part that one needs to look upon, Your Honor. The middle of the truck is five foot longer, if you change from 60 to 65 foot.

THE COURT: Well, if the collision was between the tractor itself and the car coming at right angles, what difference does it make if it is 60 feet long or 65 feet long?

THE WITNESS: Would you explain the circumstances [1562] again, because I—

THE COURT: Yes. We will take one of these types, and the truck starts to enter the intersection, and the car hits the tractor. What difference does it make whether he had 65 feet behind him or 60 feet?

A Well, it might or might not make any difference, and I can envision a number of circumstances where it could make a difference. Take a circumstances that I encountered yesterday morning wherein a truck-tractor semitrailer was 55 feet long, and made a left turn in front of me. Now, I was able to avoid that by both slowing and by changing lanes. I probably, based upon the distance between us when this maneuver became apparent to me, could have missed him had he been 65-foot long, but the probability would have been less and there also would have been a great deal—We would have come a lot closer together. Either I would have had to slow a great deal more or—

THE COURT: I am talking about your accident statistics. You have just used an angle collision between a tractor and trailer and a car.

THE WITNESS: Right.

THE COURT: Without paying any attention to whether it hit the tractor or the front end of the trailer, or the last five feet; and it doesn't seem to me that length would really become a function until you got down to if it would have been [1563] five foot longer, he would have hit it; or if it would have been five foot shorter, he wouldn't have hit it.

THE WITNESS: I disagree, because, again, we're dealing with vehicles that are trying to find a suitable gap, and it is true if you want to increment the kind of accidents that are going to happen, it would be a lot easier to envision them hitting the first five feet of the tractor or the last five feet of the trailer. When you are contrasting what happens between a 60-foot rig and a 65-foot rig, it could be the front of the tractor or the end of the trailer, but—

THE COURT: You haven't shown me yet how, if he hits the tractor, that makes any difference if he had a 60-foot trailer in back of him or a 65-foot trailer.

* * * *

[1572] Q Would you agree with the proposition that reduction in number of miles tends to reduce exposure to accidents, generally?

A A reduction in the number of miles a vehicle travels tends to reduce exposure to accidents?

[1573] Q Yes, sir.

A Yes, I would agree.

Q And would you agree that the interstate system would generally be a safer facility on which to operate—

THE COURT: Mr. Varda, let's not get into these things that there doesn't seem to be any question about, because that is repetitious. If you want to get into an area—But going over with every witness matters that don't seem to be in issue is what I mean by repetitious.

* * * *

[1575] Q So what your position is is that in dealing with twins and semis for the comparison, that you gave no consideration to any difference in turning radius with respect to vehicles?

A Since it was not relevant, we did not give any consideration to it.

Q Well, how did you determine that it was not relevant?

A Because we're talking about turning radii there that are in the magnitude of 150 or 200 feet, and all of these can turn in tighter circles than that.

* * * *

[1582] Q There are many intersections in which a strain would be imposed on the turning capabilities of the vehicles?

A Yes.

Q And in those cases, the twin type configuration would be favored in the maneuver, would it not?

A I have been told that. I believe that would be the case.

* * * *

[1583] Q Well, your data here simply assumes a constant acceleration rate through the various levels of conflicting traffic flow, does it not?

A That is correct.

Q And you have no control factor in this study for differences in acceleration, as they will be affected by driver reaction, based upon the volume of traffic flow?

[1584] A That's correct.

* * * *

[1586] Q A slight difference in acceleration for the respective types of vehicles would have a drastic effect on the results, would it not?

A No, sir, a slight difference in acceleration would have a nearly insignificant effect on the bottom line; that is, the difference in probabilities.

Q Does the fact that a vehicle is loaded or empty have an effect on its acceleration?

A On its acceleration capabilities, most assuredly.

Q Yes. And would it have an effect on the accelerations measured in your study?

A Quite possibly.

* * * *

[1587] Q You did not conduct any analyses to determine whether you had a representative sampling as between loaded and empty vehicles?

A No.

Q And wouldn't an unrepresentative sample have an effect upon the results of your study?

[1588] A Well, it would change some of the numbers, yes.

* * * *

Q So you assume that the loaded and empty characteristics of the 55-foot semis and the twins for which you were projecting the times, the accelerations would be the same?

A Yes. Furthermore, before we go too far on this line, I assume that I can—and I am convinced that it wouldn't make a whole heck of a lot of difference either.

Q Well, can you give us the formula for distance traveled as a function of time and acceleration?

A Yes, I can.

Q Would you go ahead and do that?

A Oh, my. I have written S, distance, is equal to A T squared over 2, which A is acceleration and T is the time.

Q That formula changes—Acceleration directly affects distance traveled?

A That's correct.

* * * *

[1593] Q Isn't it a fact that the driver's perception, which would be related to the volume of traffic, his reaction is a far more significant factor in measuring the accelerations than the type of measure that you have made—more significant difference?

A What I am saying is, it is not different than what we made. What I am saying is it is more significant than the point you have been hammering at and, that is, what is the acceleration capability of the vehicle?

* * * *

[1594] THE COURT: The fact that the twin might have a higher horsepower ratio, absent any showing that they were at the maximum, I just think we're straining at gnats.

MR. JOHN VARDA: It doesn't have any relationship to the—The differences that occur in the real world that weren't measured are far greater than the differences that were measured. That's where we are going, and I think perhaps the next exhibit will help us get there.

THE COURT: Okay.

Q (By Mr. John Varda) Do you have before you, sir, a copy of what has been marked for identification as Exhibit 66?

A Right, I do.

Q On the first section of that, sir—and you may wish to check this against your underlying documents—but the information is derived from copies of papers which you provided to me at your last deposition. Table IV, the encroachment times, would reflect the actual time—the actual time calculations which would correspond to Table IV of Exhibit 538?

A They would appear to be correct, yes, yes.

Q And then in the bottom, I have calculated the encroachment time differences based upon your table.

A Okay.

[1595] Q Looking over the second page of the exhibit —and perhaps first we should indicate that one of your students, a Mr. Robinson, conducted a number of the observations in this study.

A That is correct, yes, one-fourth of them, in fact.

Q And those observations were conducted on April 6—those that were included in the study.

A I believe that is correct.

Q Did he also subsequently conduct a series of observations in a similar vein on May 17?

A Some date subsequent to the preparation of this report, yes.

Q And did he submit a paper to you which included a Table IV, which corresponded to your Table IV in part in producing the results of his entire set of observations, both those in the study and those that he made subsequently?

A Yes, that's correct.

Q The observations included in your Table IV and included in Mr. Robinson's Table IV would be observations related to—the same observation at Second Avenue, would they not?

A Yes, yes, that's correct.

Q And we see on the second—let me check now. Yes, that's correct.

We then see those are reproduced in part on Page 2 of Exhibit 66?

[1596] A I would have to check that. Yes, that's correct.

Q And there are certain differences, are there not, between Mr. Robinson's set of observations and your set of observations?

A That is correct, yes. In fact, I have a summary here of the observations made at a lot of different locations and a lot of different types by a lot of different times, and obviously there are differences every time you change the sample. However—Well, go ahead.

Q Well, did you do a study of the differences in Mr. Tritsch's sample and your sample and the various Robinson samples?

A Yes, sir, I did exactly that.

Q And did you come up with similar differences in Mr. Tritsch's sample?

A Mr. Tritsch's sample was included in its entirety in the larger sample, and was done—No, I didn't. I made no separate analysis for Mr. Tritsch's sample because, as I say, the portion done at this location was included in its entirety in this sample.

Q Okay. Now, in Column 4 on Page 2, I have reproduced the differences which you have actually calculated rather than measured between the 65-foot versus the 60-foot twin based upon your Table IV.

A Yes, those numbers appear to be correct also. I could [1597] give you comparable numbers for Mr. Robinson's sample, because that would be significant. What you have in Table V is an absurdity.

[1598] Q (By Mr. John Varda) Can you explain that, sir?

A Well, you're comparing—you're dividing apples by peaches and saying because they are different, something is wrong with the study, and that, in my view, is an absurdity. What would be significant would be the difference in the 65 versus the 60. In the Robinson study, if that differs significantly from those in the Carstens study, then you would have a problem, but when you divided that number into the absolute difference, you the in fact comparing apples and peaches, and I sincerely resent any questions that would relate to Column 5. It's inappropriate and illogical.

Q Let me ask you about that, though.

A I wish you wouldn't, sir.

Q The difficulty I find in your study is the variations in the various sets of observations, in terms of the absolute differences, appear to substantially exceed the differences which you are measuring in your final table.

A No, that is totally incorrect. That is absolutely incorrect. If you will look at the bottom line, it is the percentages of decrease. You will find they correspond very, very closely right down the line, and I have done all of those calculations for all of the sets of data that were generated by Mr. Robinson or myself at several different locations, and there are remarkable consistencies among the data sets, rather than inconsistencies.

[1599] Q What I am trying to understand, and I don't see the connection here, is that when we look at the table on the bottom half of Page 1 of Exhibit 66, and we see the ultimate calculation measures the differences in many cases below five-tenths as a measure in the time differences—the actual time differences, yet in the two observations themselves, we have differences just comparing the sets of your Table 4 against Mr. Robinson's Table 4, despite the fact a portion of Mr. Robinson's Table 4 is included in your Table 4, which exceeds the time differences which are the basis of the projections for differences in the 60 and 65-foot twins, compared to 55-foot semis.

A You're back to apples and peaches. You have introduced this irrelevancy. Can I give you some relevant numbers?

Q I think you can do that on redirect.

Can I ask you this question, and maybe it will clear it up for me: Isn't it a fact that the differences in the time measurements between the respective sets of data exceed the differences calculated between the two or three types of vehicles?

A Yes.

Q Now, on some 34 of the observations contributed by Mr. Robinson to your Table 4, is it correct that Mr. Robinson rounded to the nearest second in making the time observations?

A That is correct.

* * * *

[1600] Q So you have got—Let's get this clear. The 34 observations that were rounded to the nearest second represent 25 percent of the observations included in your study in Table 4?

A That's correct.

Q And with the 25 percent of the observations rounded to the nearest second, we then calculate encroachment time differences for the respective types of vehicles which differ by as little as—

[1601] A 23/100ths.

Q —23/100ths of a second?

A 23/100ths of a second, correct.

* * * *

[1616] KENNETH J. KOEHLER,

called as a witness by the Defendant, being first duly sworn by the Judge was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PAFF:

* * * *

[1625] Q Now, getting into the BMCS data, what did your comments relate to on Defendants' Exhibit 541?

A When I looked at the report, the first thing that came to my mind—or the first thing I looked for was are there other factors that might affect accident rates present or not controlled for in the study? The title of the study seemed to suggest to me that they were comparing two types of trucks, and the only factor that was being looked at was the truck type, and it wasn't clear to me that that was really the case.

* * * *

[1627] A I said the Pierson Report did not contain sufficient information to make a meaningful safety comparison.

Q Why did you say that, sir?

A Well, after doing some more background reading, it seemed to me that the factors, such as the type of roadway, whether you're talking about a divided highway or undivided highway, perhaps driver experience, ability, or company policy for equipment maintenance, things like that that might affect the accident rate; and the report contains no information whatsoever about whether or not these factors were controlled. It just listed a set of numbers that were collected.

Q Now, what was one of the initial problems with regard to the companies that were listed in the BMCS data?

A Well, when I did my analysis of the individual companies, part of which is summarized on Exhibit 544, it seemed to me that between 1973 and 1974, the labels on the companies changed. In the BMCS study, the companies were labeled A, B, C, D, E and F; and it seemed—up to 1973. 1974 these labels changed. Now, one thing I did note was that Consolidated Freightways did not participate in the study between 1974 and 1976, and they added a new company, but it wasn't clear they kept the companies in the same order.

* * * *

[1630] Q Why did you decide to run individual company summaries?

A Well, I thought it would be one way, at this early stage, to see if the vehicle type was the only thing affecting [1631] accident rates. On the following pages I carry out statistical tests.

Q Are you referring now to Exhibit 544?

A The same exhibit. For example, on Page 4, I carried out a test to determine if the accident rate per million miles was the same for every company in the 1974 to 1976 period.

Q So I can understand that, you tested to see if each particular company had a different rate?

A I did it—Okay. I should say I did one test for doubles and a second test for tractor-semis; okay?

Q Okay. Is that—

A See, my idea was if the type of vehicle was the only thing affecting accident rate, then every company should have about the same accident rate for the doubles that they operate.

Q Did that prove to be the case, after you worked through this calculation?

A After I computed by statistics, I rejected that hypothesis. Some of the rates differ quite a bit. The difference in the statistics is significant.

Q With regard to individual companies, one rate might favor the twins, and one might favor the semis?

A No. It says that—If you just look at doubles, the accident rates are different. Companies have different accident rates for doubles; and then if you just look at tractor-semis, different companies have different accident rates for [1632] the tractor-semis. I was not comparing doubles to tractor-semis.

THE COURT: On Page 4—let me see if I'm following you—looking at doubles, with the exception of C and G, there appears to be a rather narrow range. Would that be—

THE WITNESS: That would be correct.

THE COURT: All right.

Q (By Mr. Paff) So you rejected the hypothesis—Which hypothesis did you reject, sir?

A Just looking at doubles, I rejected the hypothesis that each company had an identical accident rate for their double operation.

Q Now, we get to Page 6, and what were—You're now still referring to Defendants' Exhibit 544. What type of information is displayed there, sir? What was your conclusion on that page?

A Well, since the accident rate appeared to differ from company to company, it seemed logical to me that there must be something other than just the vehicle type that affects accident rates, and then I listed some ideas that came to mind, some factors that I thought might be important.

Q Now, have you had any experience running a trucking company or being involved in a trucking operation?

A No.

Q Have you at any other time gathered accident statistics [1633] or reported accident statistics?

A No.

Q And upon what did you base this idea that the accident rate might be greatly affected by these other areas that you indicated?

A Well, based on my previous tests, it's obvious they are affected by something; but not being an expert on accident rates, I did not know—These just seemed—These are just factors that occurred to me in my preliminary investigation.

* * * *

[1649] A Every year except 1975 favored the twins; so the answer is the same for both questions. That refers to the accident rate on Page 2.

Q Then we go through the injury rates, and in which year could we find significance in that particular data?

A Okay. I would like to go back to Page 2 for a minute [1650] and just qualify my answer. In 1971 and 1972 the value of significance level is about .06, which is close to .05, so that's kind of a borderline case, but I guess I would be willing to say there is moderate evidence in favor of twins; and the smaller that significance level is, the stronger your evidence is in favor —in this case, in favor of the twins.

Q Now, could we do the same thing with injury rates?

A That's right.

Q And, again, which years tell us what?

A Well, there is a significant difference in favor of the twins for every year except 1975.

Q Same thing.

THE COURT: A significant difference in favor of the twins for every year except 1975?

THE WITNESS: In 1975, the difference is not statistically significant.

Q (By Mr. Paff) Now, let's take fatalities. The same idea?

A Yes. None of these tests are significant at the .05 level, but it's close to 1973 and 1975.

Q When you say "close", does that favor the doubles or the semis?

A In those two years, the statistics favor the doubles.

THE COURT: Which one was that?

THE WITNESS: 1973 and 1975.

[1651] Q (By Mr. Paff) Is that information referred to then on Page 5 in your summary paragraph?

A Right.

Q And what did you conclude on Page 5?

A That this method seems to indicate that the accident rate and injury rate were significantly lower for double trailer trucks in all years except 1975.

Q And then further—

A There was not enough information to obtain a significant result at the .05 level for fatality rates.

Q So—

A Since there are fewer fatality accidents, you don't have as much information about fatality acidents, so it's harder to obtain a significant result.

[1652] Q (By Mr. Paff) Okay. Then you went on further?

A Okay. This is some speculation. If it seemed unreasonable at a time for—accident rates for doubles should actually be lower, so, if that was, in fact, the case, then it would have to be that double trailer-trucks are operated under different conditions than the single trailer-trucks.

* * * *

[1653] Q So what was your final conclusion regarding the BMCS data from a statistical analysis of that data?

A Well, it showed that the accident rates were significantly lower—and the injury rates were significantly lower for doubles in every year but 1975, but it didn't necessarily show that when—that the vehicle type was the only factor involved, that the doubles were necessarily—had necessarily lower rates just because they were doubles.

* * * *

[1681] Q What did you find in regard to the difference on those figures?

A That the difference in the jackknife rate is significant; that is, doubles had a significantly higher number of jackknife accidents per 100 million miles.

* * * *

[1688] Q —if we compared the summary of the mileage in Plaintiff's Exhibit 18, Page 28, representing 56,100,018 miles as being the mileage within the matched pair run analysis, would that give a relative idea of how much the mileage has been cut back?

MR. LEDERER: 56 million for each vehicle type, so you have to double that.

[1689] Q (By Mr. Paff) In other words, we double that to get the total amount of mileage that we are now considering?

A That's right. The total amount of the mileage in the matched pair analysis is about 112.

Q And that's of a total road operations of 400 million?

A That's correct.

Q Now, what do you do with regard to the accidents and the injuries and the fatalities?

A As I recall, approximately 83 percent of these recorded accidents were discarded, so we were left with somewhere between 17 and 18 percent of the accidents. The percentage varied with the type of accidents, whether it was an injury accident or a fatality accident.

* * * *

[1690] Q (By Mr. Paff) So what we were looking at now within the matched pair analysis is 206 of the 1,217 accidents—road accidents?

A Right. You are roughly looking at about now one-fifth of the original data.

Q And we're not at all considering the city operations?

A No.

Q And if we look at the fatalities, would the same be true, comparing those two exhibits, that we see displays 14 in your road operation column 2 in this data?

A Yes. There were two included in the matched pair analysis out of the original 14.

* * * *

* * * "The power of a test is the probability or chance that the test statistic indicates a significant difference in accident rates when the accident rates are actually not equal."

If the accident rates are not equal, of course, the one thing you would like to do is be able to detect that, so the power is the possibility that you can detect it.

[1691] Now, this power is a function of three quantities. It is a function of the number of accidents you look at, or your sample size.

* * * *

[1696] Q Before you go on, in other words, if I have a sample of 226 accidents—

A Right.

Q —I have a 50 percent chance of finding a difference in accident rates of 30 percent?

A That is correct.

* * * *

[1697] Q Now, let's look at all accidents. How many are present within the matched run analysis?

A I don't have that before me, but, as I recall, 206.

Q It is a pretty good recollection. Where would we be on the graph with a sample size of that magnitude?

A Well, if the accident rates really differed by 10 [1698] percent, then you would be in row 1, column 2, approximately at 205, so you would have a 10 percent chance of finding a 10 percent difference in accident rates.

In moving to the next column, you would have about a 25 percent chance of finding a 20 percent difference.

Q Let's go back to the first one. The converse of 10 percent chance of finding a 10 percent difference would be that 90 percent of the time you wouldn't find anything?

A Ninety percent of the time the statistic you would get would not be significant, so you would then conclude that there was no difference when, in fact, there was actually a 10 percent difference.

* * * *

[1700] THE COURT: What is the actual difference in the accident rates between semis and the twins?

MR. PAFF: Your Honor, that's displayed on Dr. Glennon's exhibit in the all injury category. The twins had 1.89—

MR. LEDERER: All accidents.

MR. PAFF: Excuse me. All accidents. This is on Page 28.

MR. LEDERER: The twin rate for all accidents was 1.89; the semi rate was 1.78. For injuries, the twin rate was .303; semi rate, .481. For fatalities, they have the same rate, .018.

THE COURT: .481, did you say?

MR. LEDERER: For injuries for semi, yes, sir. I believe that's the rate for million miles.

THE COURT: Okay.

* * * *

[1705] CROSS EXAMINATION

BY MR. LEDERER:

* * * *

Dr. Koehler, in regard to the matched pair studies, matched pair analysis, do I understand correctly that you have no objections to the methodology of the analysis? Your [1706] objections or criticisms would be in regard solely to the size of sample?

A In this case, yes, for the CF data for 1978, because there are some things that this matching would not control for. For example, if a company assigned more experienced drivers to one type of truck, that would not be controlled for in this matching, but I think CF has demonstrated that the drivers who drive the doubles and semis have about the same experience.

Q All right. So the only criticism you have is of the sample size. You have reviewed Dr. Glennon's exhibits in regard to the other biases and control of those biases, and the matched pair, and other statistics, and your only criticism is the sample size?

A Yes. Not all of Dr. Glennon's analyses with respect to the other biases have anything to do with the matched pair analysis. For example, roadway is automatically— The type of roadway is automatically controlled for in the matched pair analysis.

Q Just so I am clear on this, do you know or can you speculate no reasonable likelihod of any bias existing in the matched pair study other than problems with sample size, is that correct?

A That, and there might be some small biases due to the fact that you have only grouped on a monthly basis, but on some base—you know, trucks may have run into certain types of bad [1707] weather—hopefully, any bias of that type would be reduced by the randomization that was used.

Q Okay. With 186,000 trips for each type of vehicle, it would be highly likely that the randomization would equalize any of those factors, would it not?

A I would think so. I don't know otherwise, so, yes.

* * * *

[1708] Q (By Mr. Lederer) Let's talk about it first in terms of a confidence interval. When we have a confidence interval for Z, we are saying, are we not—and you observe a value of 100—that we're 95 percent sure that the value falls somewhere between 110 and 90?

A Well—

Q I don't know if these are the exact numbers, but—

A If you constructed a 95 percent confidence interval—actually constructed it, you would have an interval with a lower point of A, and an upper point of B, and you are 95 percent sure that this interval bracket is the true difference.

Q And when we compare two rates with a confidence level—say 95 percent confidence level—when we make a test, what we are determining is whether or not those confidence levels overlap?

A Not exactly. That's approximately true, but not quite.

Q Okay.

A If you work out the mathematics—

Q If I observe a difference, and that difference is significant at the 95 percent level, does that mean that I am 95 percent sure that the difference is not a result of a random variation, but the result of a true difference in the sample—true difference in rates?

A Anything, in terms of confidence—If you constructed [1709] a confidence interval of 95 percent for the difference, if that confidence interval did not contain zero, that would be the same thing as getting a significance level of a test statistic; so you are right in that sense; we're 95 percent confident the true difference is not zero, and that there is some difference.

Q Can you calculate what the probability is that the accident rates for twins and semis of the matched pair analysis, the rates of 100 or 106 are within a fairly narrow band, and by that let's say 10 percent of each other? Is it possible to calculate what the possibility is that they are within that band?

A Yes, I think so.

Q If we were to assume that the twin accident rate was 10 percent higher than the semi accident rate—in other words, the twins had 110 accidents and semis had 100—I'm sorry. Let me strike that and let me start again.

Is it possible—and by "probable" I mean greater than a 50 percent probability—that these two rates of 100 and 106—that the real rates are within 10 percent of each other?

A I don't know. I haven't calculated that. If you use a 95 percent significance test—

Q I'm saying don't use a 95 percent significance test. I'm asking the raw question, what is the probability—or is it more probable than not—that the twin accident rate and the [1710] semi accident rate are within 10 percent of each other?

A I don't know if I could compute that.

MR. LEDERER: May I approach the witness, Your Honor?

THE COURT: You may.

Q (By Mr. Lederer) Dr. Koehler, previously during a recess we went over—I think you had a chance to satisfy yourself that this calculator I'm using was programmed to calculate the Z level according to your statistic?

A That's right. Yesterday you showed me that.

Q I show you a calculation, assuming that the semi accidents were 100 and the twin accidents were 110 and that the mileage was 56,100,018 for each class of vehicles —just what it was in the matched pair analysis—and I give you a standard table of Z values, and ask you if you can tell me whether or not it is probable that those two rates are within 10 percent of each other; that the real rates are within 10 percent of each other.

A What you can tell from this—

MR. PAFF: When you say "this", what are you referring to?

(Witness indicates slip of paper.)

MR. PAFF: A grocery list. Okay.

THE WITNESS: From your calculation, based on the numbers you just gave me, you get a Z value of minus .690, to the first three significant digits. Now, if you had done a [1711] test—if you were doing a test with a 95 percent confidence level, you would not reject the hypothesis that the accident rates are the same. Okay.

On the other hand—and I think this is what you are getting at—if you do a test with a 50 percent confidence level, then you would be able to reject the hypothesis that the accident rates are the same. But by using a 50 percent confidence level, you're allowing yourself to make an error in 50 percent of your experiments that you would do this way; that is, 50 percent of the time you would say there was a significant difference when there really wasn't.

Q (By Mr. Lederer) Actually that confidence level would be slightly higher than 50 percent?

A It might be.

Q 51 or 52?

A It might be 51 percent, yes.

Q What that says is that the probability is that the rates for twins and semis are within 10 percent of each other, does it not—the real rates are within 10 percent of one another?

A It says—yes. If you have constructed a 50 percent confidence interval, it would not have contained zero. It would not have contained zero, so that—but I don't know how far we could stretch it in the other direction. See, I guess what I want you to do is actually compute the confidence level.

[1712] Q Well, let me just come back to it again. Let's say this: If I were using a 50 percent confidence level, what that would be saying—or 51 percent—what that would be saying is that 51 times out of 100, when I observe a difference, it's the result of a real variation and not the result of random variation, correct?

A That's correct.

Q And if I applied a 50 percent confidence interval to this data, I would observe a difference when the rates are more than 10 percent apart, correct?

A No. It doesn't say anything about the size of the difference. It just says that if there is a difference—it says that 49 percent of the time when there is no difference, your statistic will tell you that there is a difference, and 51 percent of the time when there is no difference, your statistic will indicate that there is no difference.

Q Can you tell me what the probability is that the rates are within 10 percent of each other?

A I can do something like my power calculation, and tell you, if the rates differed by 10 percent, what the probability is you would discover that with the test.

Q I guess what I am asking for is something much more direct than that, and that is, these two rates are samples, correct, each of these rates are sample?

A Each rate is an estimate computed from a sample, right.

[1713] Q (By Mr. Lederer) Okay. And, conceivably, because we have a sample, we pull it out one time, and we might get a 100. Next time we might get 101. Next time we might get 99. The fourth time we might get 97 for the rate.

A That's correct.

Q What I am asking is what is the probability that the true rate we sample from is within 10 percent of each other? Do you know that probability?

A Well, I guess I would like to compute the confidence interval, but thinking backwards through the calculations, yes, this would tell you—I think the best I can do is to do a power table again. If you want to work a 50 percent confidence, and you say the rate differs by 10 percent, then you could compute the probability of detecting that difference based on the sample size 200. I think that's the best I could do.

Q You have no means at your disposal, or you are unable to calculate what the probability is that the two rates are within 10 percent of each other, or even expressing it more simply—

A I could express it in terms of power—a power table, but you are asking me something just in terms of significance level.

Q Well, I guess I'm trying very hard to avoid the use of the word "significance level", to avoid the use of the words "power of test", and express it in probabilities. Is it [1714] probable—I will return to my question. If you can't answer it, I understand that.

Is it probable—and by "probable" I mean greater than 50 percent likely—that those two rates are within 10 percent of each other—true rates?

A Well, you are saying based on a sample size of 210—

Q Yes.

A —if you had obtained this result by which the rates differ by 10 percent, you are asking me is it likely that they actually do differ by 10 percent? Is that the question?

Q That's right. Is it more probable that they are within 10 percent of each other, or more probable that there is a variation greater than 10 percent in the real rates?

A Well, the most probable result is that—I don't know how to explain this. The actual estimates—When you compute the estimate, the estimate differs by 10 percent. So the most likely occurrence would be that they differ by 10 percent.

Q Let's, I guess, bounce back once more.

A I guess I really can't answer your question. I really can't make a calculation like that. I can make calculations that tell me what chance I have of detecting such a difference given a sample of a certain size and a certain significance level.

Q All right. Let me try—I don't want to further [1715] confuse this, but let me see if I can't go at it a slightly different way.

If I apply a 50 percent confidence level, what I am saying, in effect, is I want to be 50 percent sure if I observe a difference, it is a true difference and not a difference of random variation in the samples, correct? Fifty percent. You can express it either way.

A Say you compute a 50 percent for the difference. That means that for—and you did this experiment over and over again. That means for 50 percent of your experiments this confidence interval would actually contain the true difference.

Q Okay. Now, if the difference—if the true rates were 110 and 100, a 10 percent difference, and we did the experiment over and over again—I'm sorry.

A You can think of it this way: Each time you do an experiment, you construct the 50 percent confidence level. So theoretically, there is a big bag of confidence intervals sitting there, and each time you do the experiment, you randomly pick it out and look at it.

Q If the difference is 10 percent. If my confidence interval were 50 percent, I would more times than not—51 percent—excuse me—I would more times than not observe a difference, right; 51 out of 100 times?

A Well, 50 percent of the time, yes, that interval would contain a difference of 10 percent.

[1716] Q Let's just leave it. As I understand what you are saying, to let me return to my original question, you cannot calculate whether or not it is more or less probable that the rates are within 10 percent of each other, is that correct?

A That's correct, but if the rates actually are—if the difference is 10 percent and you constructed a 50 percent confidence level, then 50 percent of the time this confidence interval will contain the difference of 10 percent.

Q I think what I left it at is—Just to be very clear in my mind, you do not know whether it is more probable than not that the two rates are within 10 percent of each other?

A Well, I think that's correct. You see, you are asking me about the probability that the two rates are equal to exactly one point as opposed to all other possible points that they could be equal to.

THE COURT: What will be the possibility that the accident rate might vary from 5 percent more to 15 percent more, one over the other?

THE WITNESS: Well, I don't know what the number would be. It would be highly likely that the rate—the difference would be—If you observe a difference of 10 percent, it would be highly likely that the relative difference would be 25 percent and 15 percent, but I don't know what that probability would be offhand.

Q (By Mr. Lederer) We observed an actual difference of [1717] 6 percent?

A That's correct.

Q Okay. And it is more probable that the true difference in the rates is somewhere between, say, 2 percent and 10 percent than it is between 0 percent and 12 percent—I'm sorry. Let me go back.

A The opposite.

Q It is more probable—We observed an actual difference of 6 percent. It is more probable, is it not, that the true difference in rates is not less than 2 percent and not more than 10 percent than it is probable that the true difference is less than 2 percent and not more than, say, 0 percent, and that it may be greater than 10 percent and no greater than 12 percent?

A I could compute that, but I don't know if that's true.

A Well, when we have a normal distribution curve, that is a bell-shaped curve, is it not?

A Yes.

Q And the top of that bell would be where the rate actually—observed rate is?

A That's right.

Q And I've got a span between 2 and 10 percent on 8 percent of the bell?

A Okay.

[1718] Q And that's in the center of the bell, right?

A Yes.

Q And that 8 percent is going to cover more of the possible probability, the area under the curve, than it would 8 percent measured 4 percent on each side out at the outer edges of the bell?

A You have 80 percent inside, is that correct?

Q Let me perhaps use the chalkboard for an illustration.

A Okay.

Q When we say we've a rate—Let's say in this case 106—

MR. LEDERER: Can you see that, Your Honor?

THE COURT: I can see it.

Q (By Mr. Lederer)—for the twins and—

MR. PAFF: May I move, Your Honor?

THE COURT: Pardon?

MR. PAFF: May I move over here?

THE COURT: Yes.

Q (By Mr. Lederer) —probability tells us, does it not, that the rate could fall anywhere on this bell—the true rate?

A No. The numbers for the rates are on the horizontal line on the bottom.

Q I'm sorry. Yes. As we go along, the rates could be—Let's just say arbitrarily this is 95 and this would be [1719] 117 down here. Okay. When we talk about a 95 percent confidence level, what we are saying is if I cut off the bell here and I cut off the bell curve here, 95 percent of the possibilities would fall in this range?

A That's right.

Q Okay. Now, when we have this observed rate of 106, it is much more probable that the actual rate is close to 106 than it is that the actual rate is out here at 117?

A Well, the probabilities are directly proportional to the area under the curve.

Q That's right. So it is probable that the rate is somewhere—more probable that the rate is close to 106 than it is out at the extremes?

A The way you have drawn it, I would say between those two marks on top, you have maybe 30 percent of the probability.

Q Okay.

A So there would perhaps be 30 percent chance of being between those two marks.

Q And if we drew an equal interval out here, this probability might be 10 percent, or 5 percent?

A An interval of equal width?

Q Yes.

A Okay. That's right.

Q Okay. So when we look at this value of 106, it is probable, is it not, that the true value for twins is somewhere—[1720] it is more probable that it is closer to 106 than it is way out at some extreme?

A Okay. It is more probable—Now, I see what you are asking. It is more probable, say, that the true value is between 102 and 110, which is an interval of 8, than it is between 110 and 118.

Q That's right.

A Right. Now, I understand.

THE COURT: Is it more probable that it is in between 102 and 110 than it is outside that range?

THE WITNESS: That depends on how many observations you've taken. You see, if you took more observations, you would have the same shaped curve, but it would be higher in the middle. It would be squashed in.

Q (By Mr. Lederer) So the shape of the curve determines what this 30 percent that we have labeled up here—the shape of the curve determines what that is. All right.

A And that is determined by how many accidents you look at.

Q Okay. For the twin rate of 106, can you determine for us what range would cover 50 percent of the probabilities? In other words, what range would it be most likely if it went to 51 percent that it would cover?

A Yes.

Q Could you do that? Would it take very long?

A Maybe 15 minutes. I don't know.

[1721] THE COURT: Why don't we let you work on that during the lunch hour, and go on into another area.

THE WITNESS: May I make a note of that?

MR. PAFF: Yes.

MR. LEDERER: I would offer you the use of my calculator for the lunch hour, if that would be helpful.

THE WITNESS: I brought mine.

Q (By Mr. Lederer) Dr. Koehler, in regard to the injury rates in the matched pair analysis, what is the Z calculation, or what significance level would we determine that semis have a higher injury rate than twins?

A If you use the significance level of .05, or a confidence level of 95 percent, then you would say that the rates are different if the Z level was larger than .09 and smaller than minus .096.

Q If you drop to a confidence level of 90 percent, would there be a significant difference in the injury rate in the matched pair analysis?

A I don't know. Could you repeat the Z value?

Q Yes. Perhaps you can just tell me what confidence interval—What would be the probability that the semi accident injury rate is in fact higher than the twin?

A The Z value is 1.507, and if you used the test with a significance level—or confidence level of about 86 percent, then you could reject the hypothesis of equal rates.

* * * *

[1722] Q If I accepted the possibility of being wrong 14 percent of the time, that test would say, "Hey, there is a difference between the semi injury rate and the twin injury rate, and the semi rate is higher," and I would be right 86 times out of 100?

A That is correct.

Q Would you regard that as at least moderately strong evidence that semis have a higher injury rate than twins?

A That's moderate evidence.

THE COURT: That's what?

THE WITNESS: Moderate—moderately strong evidence.

* * * *

[1723] Can you explain what a nonsense correlation or a nonsense regression is?

THE COURT: What is the word?

MR. LEDERER: Nonsense correlation or nonsense regression.

A I think the way that term is usually used, it's when people find the outcomes of two phenomena to be highly correlated, when there is really no physical reason why they are. One doesn't necessarily cause the other.

Q Would an example of that be, for instance, in Professor Snedecor's book, that you referred to in your deposition, there is a high correlation between the birth rate in [1724] the United States and production of pig iron in Britain?

A Yes. That is correct. For example, if you built another pig iron plant, that doesn't necessarily mean that you would increase the birth rate by a similar proportion.

Q Even though the statistics might show a high correlation, it means there may not be any causal effect?

A That's right. The production of pig iron doesn't directly cause people to be born. On the other hand, they both might—the population and pig iron production might grow at the same time because the population is expanding.

Q In your analysis of the BMCS study, could you observe any demonstrable biases, as opposed to speculative biases; in other words, biases that you were sure existed or could demonstrate existed, rather than ones that you hypothesized might exist?

A No information was provided to make that determination.

Q So you only hypothesized that the biases might exist?

A That is correct.

Q Did you observe any demonstrable biases in the Bio Tech study, the Freitas study, in California?

A Yes. In that study one could observe—Well, I'm not necessarily sure what your meaning of "demonstrable" is, but in that study, for example, the counting stations were located such that four were in the urban area and 11 in the rural area, whereas of the highway on which the accidents were [1725] recorded, only about 1.26 percent of that highway was in the urban area, which would make me think they overcounted vehicles that—the vehicle count from these counting stations in the urban area were over-represented.

* * * *

Q To the extent that this bias arose from the use of rural and urban counting stations, and because the accidents were almost entirely rural, was this a bias that favored twins or favored semis?

A Well, one really can't make a calculation from that study to see what the size of the basis is, but I would suspect it would favor semis, in the sense that their rate might look slightly smaller than it really is.

[1726] Q I don't want to belabor this point, because I think you and Dr. Glennon are in substantial agreement on the California Highway Patrol report and the Reiss report, but let me just ask, is it your opinion that both the Reiss report and the California Highway Patrol report have serious flaws in them?

A That is correct.

Q And flaws of roughly equal seriousness?

A I would say yes, but I also must say the flaws—the absolute effect of the flaws cannot be measured from the data provided.

* * * *

[1730] Q Dr. Koehler, just before lunch the Court asked you if you had reviewed Dr. Glenonn's study of the divided and undivided roads. Had you done so prior to lunch?

A Yes.

Q And what was the conclusion that you reviewed? Did you find the math in that analysis correct?

A I found that they plugged the formulas—plugged the numbers into their formula correctly, and did the arithmetic correctly, but I had trouble with the formula itself.

Q In what respect did you have trouble with the formula?

A The formula had a variable called X, and X is the ratio, as I recall, of the accident rate per million miles on undivided highways to the accident rate per million miles on divided highways. And in this calculation it was assumed that the value of X was the same for both the double vehicles and the tractor-semis, and I don't think there is any way to get [1731] that information out of the study or to estimate—

Q Do you have any expertise or background in the area of highway safety analysis?

A No.

Q Could someone in that field be qualified to make an estimate that if the divided had more than the undivided, they would have an increased answer by roughly equal amounts to all vehicle types? Might someone in the field be able to draw that conclusion, whereas you might not?

A That could be possible.

Q Does that study make any assumption regarding the actual rates of twins and semis, as compared to the ratio of rates?

A It makes an assumption about the ratio of rates.

Q No assumption as to the rates themselves.

A No.

Q Do you know whether or not in general if divided highways are less hazardous for one vehicle type or less hazardous for another vehicle type?

A I don't know if that's true.

Q You don't know if it's untrue either? You do not know one way or the other, is that correct?

A That's correct.

* * * *

[1738] Q Given the fact that most accidents occur on the trailing equipment, and that the trailing equipment is considerably more expensive for the twins than semis, would the use of a dollar cut-off criteria, such as $2,000, tend to introduce a bias into the statistics?

A If those assumptions are correct, I would say that it would probably tend to bias the statistics.

* * * *

[1739] Q It would be a bias against twins, would it not? In other words, twins would tend to be over-reported?

[1740] A If all your assumptions are correct, that would be true.

* * * *

[1747] Q After you obtained from Consolidated Freightways the 16 computer runs which you requested, did you make analyses of the various accident types?

A That's correct.

Q And let me ask you first, before we go any further, in all of your analyses and your approach to the statistical problem, in part, of comparing semis and twins, did you make your approach with an open mind?

A I think so, yes.

Q You were as willing to accept evidence that twins were safer than semis as you were that semis were safer than twins?

A Yes.

Q Did you observe any other accident types, other than upsets and jackknifes, in which there was a significant difference between the two vehicle types?

A Yes. I did some calculations for rear-end accidents [1748] in which there was a significant difference.

Q And what was that difference? Was that difference in favor of—

A As I recall, there were two types of rear-end collisions; one in which another vehicle ran into a truck, and for that type of collision the rates were significantly lower, as I recall, for tractor-semis. But for the other type of rear-end, where a truck runs into the rear-end of another vehicle, the rate was significantly lower for the doubles.

Q Why wasn't that chart included in this exhibit?

A Well, I wrote up—Well, I showed my rough calculations to Ed and Mr. Paff, and I guess we decided we didn't want to. I don't know. I guess we decided we just wanted to present the exhibit on upsets and jackknifes.

[1749] Q (By Mr. Lederer) Is that because the jackknifes and upsets showed a higher rate for twins, where the rear ends showed a higher rate for semis?

A I suppose so. I guess we just wanted to show that for some accident types, the doubles have higher rates than tractor semis.

Q Are there any other accident types in which semis had a higher accident rate than doubles?

A Well, I don't know if I did any calculations that showed that, but that appears it might be the case with similar calculations that Consolidated Freightways have in one of their exhibits that I believe Mr. Glennon prepared.

* * * *

[1750] Q Was there a significant difference in the number of passing and side-swipe accidents with semis as compared to twins?

A I haven't computed a statistic. Looking at the numbers, I would say the difference in the side-swipe accidents would not be significant, but I don't know about the passing [1751] accidents.

Q All those figures would suggest that the semis have a higher rate, would they not, although you don't apparently know whether it is significantly higher?

A The observed rate for tractor semis for turning and passing and aside-swipe accidents would be higher for total accidents.

Q Okay. Did you perform any calculations to attempt to see whether weather was a factor in the jackknifes and upsets of the twin trailers or with the semitrailers?

A I don't recall. I don't think so. If I did, they would have been in my third deposition—or my second, one of those two depositions.

* * * *

[1752] Q Looking at accidents overall, did you make any [1753] observation in regard to exposure?

A I think my observations would be the same as those presented in Mr. Glennon's exhibit; that doubles had a higher rate of accidents in snowy and icy conditions and tractor semis had a higher rate in west conditions, but that was not surprising to me after I was told that the doubles don't operate in the southeast. A large number of CF tractor semis operate there.

Q In other words, some of these differences in accident type are quite probably caused by differences in exposure rather than differences in the vehicle configuration?

A That's true.

Q And the converse of that, it would be erroneous to claim that the higher number of jackknifes for twins or the higher number of rear-end accidents for semis is the result of the vehicle configuration rather than being the result of exposure for—or differences in exposure?

A Yes, just from the data we had available.

* * * *

[1757] Q All right. Now, are you fairly well satisfied from Dr. Glennon's exhibits and review—and I realize you haven't had the benefit of Mr. Schlueter's and Mr. Wrightson's testimony, but are you fairly well satisfied that at least for the '78 CF data, there aren't any biases that favor twins over semis?

A I am pretty much satisfied with the matched pair * * *

* * * *

[1771] Q Let me show you—Let me ask you, first, is this the first large-scale accident study that you have reviewed?

A The first of the large-scale traffic accident studies.

Q Okay. Are you aware if it is common practice in accident statistics to combine number of years of operation in order to obtain a large enough statistic to make a meaningful comparison?

A Yes, to obtain a large sample of accidents, one would probably have to combine several years of data.

Q Yet me show you what has been marked as Plaintiff's [1772] Exhibit 69, which was formerly Pierson Deposition Exhibit 3, and ask you if you have seen that previously.

A Yes. This, as I recall, was part of the Pierson Report.

Q I don't believe this actual combination existed in the study itself, but this was a separate add-on to it. Did you calculate for the seven years covered by the study the statistical significance of the difference between the accidents, injuries and fatalities for the entire seven-year period for semis and doubles?

A I think I did, yes.

Q And in every category, were the doubles better than the semis?

A In every category, the doubles had lower rates on a per-mile basis.

Q Statistically significant lower rates?

A Well, I know that's true for accidents and injuries, but I don't recall if the difference for fatalities was statistically significant.

Q Let me ask you one final question. Are you aware of any credible statistical evidence that shows that semis are more safe than doubles?

A I would have to say no.

Q I asked you earlier in your testimony if you had approached this with an open mind. I believe you stated that [1773] you had. Could I draw your attention to the exhibit entitled "Analysis of the Summary Data For Each Year"?

MR. PAFF: Which exhibit is that?

MR. LEDERER: I believe it is Defendants' Exhibit 543.

Q (By Mr. Lederer) In that exhibit you first made a calculation on a per-year basis for the statistical significance of the difference between semis and twins, and on the top of page 5 you made the conclusion "That this seems to indicate that the accident rate and injury rate were significantly lower for double trailer trucks in all years except 1975." You then went on in the next paragraph to say, "It seems unreasonable that accident rates for double trailer trucks should actually be lower."

Why did you regard that as an unreasonable conclusion?

A Well, this is the very first thing I did in August when Mr. Lagomarcino first approached me. This exhibit, along with Exhibit 544, was sent to Mr. Lagomarrcino with Exhibit 541, which is the letter. I think at that time I might have thought that way, but I think now I am juset sure.

Q Did your mind change as you saw more and more of the data?

A Yes, it did. I mean, as I saw—especially since I have seen the matched pair analysis, that indicates to me that there are no large differences; say, one rate isn't twice as [1774] big as the other.

* * * *

REDIRECT EXAMINATION

BY MR. PAFF:

* * * *

[1782] Q Based upon your testimony and your review of all the documents in this case, and from a statistical point of view of all of the analyses that you have done, what would be your [1783] opinion as to the relative safety of the doubles in regard to the semis?

A I think the only conclusion that—the only experiment that I would use to make the comparisons would be the matched pair analysis, and that indicated to me that there were no large differences in the accident rates, differences of a size of 50 percent or more; but since that experiment only looked at 206 accidents, it did not have a very good chance of a similar difference than 10 percent.

That analysis also only looked to two fatalities. Two fatalities are not enough to find a significant difference. Test statistics could not be significant based on two fatalities. The other studies, such as the BMCS and the California Highway Patrol study and the Reiss Bio Tech study—I don't think those can be used to make different inferences about the relative safety of two vehicles, because there are so many other factors possibly involved there that affect the accident rates.

Q Getting back to the matched pair analysis, you're talking now about the accident rate or the injury rate or the fatality rate; those are three separate calculations?

A Yes.

MR. LEDERER: He didn't speak as to the injury rates, I don't believe.

Q (By Mr. Paff) So what we come down to is we can't [1784] say anything about the relative number of fatalities?

A No. One fatality was observed for each type of truck, but even if two fatalities had occurred for one type truck, and zero for the other, that would not have been enough evidence to declare a significant difference. You need to look at more than two fatal accidents.

Q If we could define safety in terms of some number of fatalities, the matched pair analysis wouldn't tell us anything in that regard?

A No. That is correct.

Q Now, if we look at the injury rate, what does the matched pair analysis indicate?

A For the injury rate, the matched pair analysis provides moderate evidence—or slight to moderate evidence that the injury rate is lower for the twins.

Q Now, when you use the term "slight to moderate", could you quantify that?

A Well, I think most statisticians feel that if something is significant at the 10 percent significance level, that provides moderate evidence that there is a real difference. And this result has a significance at 14 percent significance level, so you can make an error 14 percent of the time, so its near the moderate range.

Q And with regard to the accident rate?

A Well, in this study the accident rate was slightly [1785] higher for the doubles, but I don't think it really tells me anything. That result had a high chance of happening, a pretty good chance of happening, just from the random sample—the random sampling, so that is not a conclusive result.

Q With regard to the current statistical status of the data presented, and what you have examined, would there be need for more examination of this area, in your opinion?

A Yes, I think so. I don't think the question has been definitely answered, especially in terms of accident rates—well, in terms of any of the rates.

Also, the Reiss finding, while not nearly conclusive in having many vices involved in it, indicated that doubles might have a higher fatality rate.

* * * *

RECROSS EXAMINATION

BY MR. LEDERER:

Q You indicated, I think, some concern that the Reiss finding, even though possibly the result of bias—and I think we discussed earlier whether that is a demonstrable bias or not—The Reiss report did have a finding that twins had a significantly higher fatality rate than semis, and that caused you personal concern. Was that your statement earlier?

A Yes.

Q Does it cause you personal concern that the other [1786] studes, which have no demonstrable biases in favor of semis, but only have speculative biases, that many of these studies show a significantly higher fatality rate for semis than for twins?

A Which study shows the significantly higher fatalities?

Q Does that BMCS study show a higher fatality rate for semis than for twins over that period?

A I don't recall.

Q You didn't regard it as important to calculate?

A If I calculated it, I don't remember the results. I know on the yearly basis, when I calculated them—it would be my other exhibit here, Exhibit 543—that none of the differences were significant, of the five percent level.

Q For what period?

A This is Exhibit 543. On Page 4 I did a test for the difference for each year.

Q And if you don't find a significant difference over each individual year, you might find a statistically significant difference over the entire period of years, might you not?

A That is possible, because you have more accidents.

* * * *

[1790] THE COURT: Favoring?

THE WITNESS: Favoring doubles.

THE COURT: And that was fatalities?

THE WITNESS: Yes. This would say the fatality rate over the eight-year period in the BMCS study—or seven-year period. I'm sorry.

MR. LEDERER: Seven-year. I'm sorry. I think I am the one that started saying eight. It is seven.

THE WITNESS: That during that period the fatality rate was—the observed fatality rate was lower, significantly lower for the doubles.

* * * *

[1794] STUART C. EISCHEID,

called as a witness by the Defendant-Intervenor, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BITTNER:

* * * *

Q Are you employed?
A Yes.
Q By whom?
A The Motor Club of Iowa.
Q In what capacity?
A As a vice-president.
Q And how long have you been with the Motor Club of Iowa?
A Approximately twelve years.

* * * *

[1800] Q What is that policy?

A The policy at this point is that they do not believe in 65-foot double bottoms, nor increased weights; and the feeling is that these trucks in Iowa will increase the volume, will increase the possibility of accidents, and be a safety factor. Our Board of Directors, which represents residents of the State of Iowa, are relying on the feelings of our members, and feel they should not be approved.

Q How long has this been a Board policy, if you know, Mr. Eischeid?

A Probably since the late '60's, maybe the early '70's.

Q Has there ever been a deviation from this policy?
A Yes, absolutely, there has been.
Q Do you know when that might have been?

A It was in 1973. It was the consensus at that time of management that very probably Iowa was going to approve the 65-foot double-bottoms. The policy was changed to say we [1801] would not oppose if the trucking industry would pay their fair share of the increased costs of maintaining the highways.

Q And was that policy a temporary position?

A It was very temporary, because the trucking industry disagreed completely.

Q And was that position then abandoned?

A That position was abandoned.

Q And what is the Board policy at this point in time?

A The Board policy at this point in time is that we opposed 65-foot double-bottoms.

* * * *

[1813] Q (By Mr. John Varda) Sir, I show you a document, and ask you if you recognize that as the Annual Report of the Public Affairs Department of the Motor Club of Iowa, January 1, '76, to December 31, '76.

A Yes.

Q And, if you will, look at the next page, which is a copy of page 20 on that report. Does that relate to your organization's legislative policy?

A Yes.

Q And does it indicate that the policy matters which are set forth in various paragraphs—the policies are going to be continued through the second session of the Iowa Legislature of 1978?

A That's right.

Q And looking down the page, Policy D, do we find the same policy statement with respect to 65-foot twin trailers that we found in the Iowa Motor News of January-February, 1975?

[1814] A Yes.

THE COURT: Would you read that again to me, please?

THE WITNESS: "The Club should continue its present policy in opposition to further increases in legal motor vehicle sizes and weights permitted on public streets and highways. This policy was modified in November of '73 to tolerate 65-foot double-bottoms provided the longer and heavier vehicles are assessed additional road use tax fees."

Q (By Mr. John Varda) Did that policy, sir, which you termed as a temporary policy, continue from 1973 at least to 1978?

A That's not true.

Q At the time this Annual Report was made, was the Motor Club of Iowa involved in a lawsuit with the Department of Transportation?

A This Report is ending December '77. We were involved in a lawsuit, and I am sure it was in 1976, with the Department of Transportation on 65-foot double-bottom trucks.

Q What was the date of meeting at which your policy of 1973 concerning twin trailers was rescinded?

A I don't know. I don't recollect.

Q Do you know what reason there was that a copy of the minutes of that meeting was not presented to the Plaintiff in this proceeding in response to a subpoena duces tecum that was served on you?

[1815] A I have no idea. We gave you excerpts of all of the minutes of our Board of Directors' meetings. I think I must go back to the meeting of '73. The consensus of our Board was that if we could work something out with the truckers—We never were able to do it.

Q You indicated at the outset of your direct testimony that your intervention here was connected with safety factors and cost factors. Isn't it a true statement that your intervention here is connected with cost factors and not safety factors?

A No. If you—

* * * *

[1826] LEO CHARLES PETERS,

called as a witness by the Defendants, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PAFF:

* * * *

Q And by whom are you employed?

A Currently I am self-employed as a mechanical engineering consultant.

Q And do you have another occupation, sir?

A I do. During the school years I am employed as a professor of mechanical engineering at Iowa State University.

* * * *

[1834] Q Now, with regard to the Utica test and the Virginia test, what does your review of those particular tests indicate with regard to you?

A Well, it indicates that basically the systems are much more complex on the twin, and have to be very closely tuned with the same equipment on each axle. They have to be balanced in order to—and the timing has to be fast, which requires some additional components on the twin in order to compete with the semi on stopping.

Also the Virginia test indicated that both semis and twins took much longer to stop than a conventional automobile, and that there was a lot of room left for improvement of stopping distances on both units.

Q Now, did you also make an investigation with regard to the passing situation?

A I did.

Q And so we can be clear on this, what type of vehicles did you consider when we get to the passing area?

A Well, I considered the difference in passing five additional feet, so whatever 60-footers are on the road, I used as a base, and I compared the passing time and passing distance of a 65-foot twin with a 60-footer, and did this—One of my concerns was in how much additional time and distance would be spent in an area—in a condition where there would be either splash and spray or snow blow-out, and so looking at a distance [1835] or a time that a vehicle in the passing mode would be in such a zone.

Q And what did you find with regard to your calculation?

A If I may refer to some notes, I found that if we're talking about 10 miles per hour relative speed, that the extra five feet requires a little over 27 feet additional length to pass. .34 seconds is involved with this 27.24 feet, and that's if the passing vehicle is traveling at 55 miles an hour, so to make—

THE COURT: What was the time?

THE WITNESS: .34 seconds. So the conditions, passing vehicles 55 miles an hour, the twin—the 65-foot vehicle would be traveling at 45 miles an hour, top speed maintained, and the passing vehicle would be in the zone of splash and spray or snow blow-out when those conditions existed for an additional 30 feet.

If we look at a five mile per hour differential where the passing vehicle is going 55 and where the 65-foot vehicle is going 50, then the additional time required to pass that five feet is .68 seconds, and that means that you are in that zone 54.8 additional feet.

THE COURT: Give me those figures again.

THE WITNESS: Okay.

THE COURT: What are the two speeds? 55 and—

THE WITNESS: 55 for the passing vehicle, 50 for the [1836] 65-foot vehicle. The additional time required would be .68 seconds, and this translates to 54.86 feet additional space.

If we look at one other case where the passing vehicle is traveling 55 miles an hour and the 65-foot vehicle is traveling 52 miles an hour, then the additional time required to go to the additional five feet is 1.14 seconds, and that translates to 91.96 additional feet that the passing vehicle would be in that zone.

[1837] Q (By Mr. Paff) Is this just the zone that relates to the five additional feet?

A It is.

Q Now, have you discussed passing with the attorneys for the plaintiff in your depositions on previous occasions?

A I believe we covered this area, although I would have to review my deposition to see in how much detail, on the third deposition that was taken.

Q What does that lead you to conclude with regard to these additional distances to pass?

A Well, with the additional five feet in conditions where there are splash and spray or snow blow-out present, that can be related to obscuring of vision. It's certainly a safety consideration in the operation of 65-foot vehicles.

Q Now, why is this splash and spray a particular concern?

A Well, the big reason is your vision is obscured while you are in that zone, and even though it may only be intermittently obscured—you have the windshield wipers working as hard as they can—you are still in a zone where the vision is obscured, and you can become disoriented, you can lose track of where you are on the road, or if you happen to hit the brakes and some vehicle is following you into that zone, you could be hit also.

Q Now, did you look at one other area with regard—I [1838] know you looked at numerous areas, but did you look at another specific area with regard to the tractor-trailer semi and the 65-foot double bottom combination?

A I did.

Q What area was that?

A That area was jackknifing.

Q We have had a lot of discussions throughout this case regarding jackknifing. Could you explain what a jackknife is?

A Well, a jackknife gets its name from the configuration that the tractor and trailer takes during the time the incident takes place. They start folding up with respect to each other.

The situation occurs when one of the vehicles in a train, be it a train of two or a train of four, as we're referring to here, slows down or speeds up with respect to the other vehicles in the train; and when this occurs, for example, if the tractor slows down with respect to the trailer, it does this by either losing traction or spinning out and starting to turn, then the trailer tries to overrun the tractor and pushes it, and basically under these conditions the vehicle combination is out of control. This can be initiated from either the tractor end or, if the trailer starts getting—I should explain one other thing before I go further here.

The traction depends upon the amount of braking that [1839] exists. If you are in a stop mode—and you have the most braking just before the wheels lock up. As soon as the wheels lock up, then the amount of braking or the amount of traction is reduced, and as soon as the wheels start skidding, that wheel has no more directional control; there is no more side force on the wheel that can help to maintain any direct line of travel. So if a trailer wheel locks up during a braking maneuver, and the front trailer is still braking, the rear trailer will not be retarded as much as the front trailer, and will tend to overrun it.

Then, due to the connection between the front trailer and the rear trailer, having two points, and the front trailer pushes forward, unless those points are exactly lined up, the push is going to move the—or rotate the dolly in a direction, and then the trailer, having that input with the dolly rotating, will also spin and start going sideways, or tend to go sideways, and will start a jackknife in that fashion.

Q Now, are there two types of jackknifes?

A Well, I have read literature which indicates that jackknifes can be classified as tractor jackknifes or trailer jackknifes. The end result is the same. The vehicle is out of control during the jackknifing time unless steps are made to bring it out of jackknifing or, if the unit continues out of control, until it's stopped of its own volition.

Q Now, did you compare the jackknifing of double units, [1840] as opposed to tractor-trailer semi units?

A I did.

Q And what did you find in that regard?

A That the single-axle tractors are more susceptible to jackknifing than the tandem-axle tractors; which, in our terms, translates to twin tractors are more susceptible to jackknifing than the standard semi units.

Q What is this a function of, sir?

A The major thing is the weight that is on the rear end of the tractor. In a twin unit, the weight that is on the rear end of the tractor is the weight that is in the front trailer. On a semi unit, the weight that is on the rear end of the tractor is the weight that is in the front end of that trailer, but it's a larger proportion of the weight of the entire unit. The directional force, or the force that is trying to keep this unit from jackknifing at the rear wheels, is a side force, and its value is the weight that is on the rear wheels times the coefficient of the traction that exists at that time. Therefore, if you have more weight on the rear end, that unit will be less susceptible to jackknifing.

There are tire adhesion factors. You have more rubber on the road on the rear end of the semi than you do on the twin tractor, and that combination makes a semi tractor less susceptible to jackknifing than the twin tractor.

* * * *

[1842] THE COURT: Cross examine.

CROSS EXAMINATION

BY MR. JOHN VARDA:

Q Dr. Peters, let us first discuss your background briefly. Can you indicate what per cent of your time is spent in your consulting work?

A In the summer 100 per cent. I am not employed by the University during the summer. In the school year, evenings and weekends, unless a trial or a deposition involving a great number of lawyers is involved. And the percentage of work time, around 15 per cent during the school year.

Q Does a larger portion of your time as a consultant involve consulting for attorneys?

A I do more consulting for attorneys than I do for others; but others, including companies, have asked me to consult with them.

* * * *

[1843] Q I notice among the publications listed in your resume, one is Law and the Engineer, and another is entitled Moot Court Trial Extract, and another is the Expert Investigator and the Adjuster in Subrogation, and a number of other titles. Have you devoted some considerable portion of your time studying the legal aspects of engineering, presentation of evidence in a legal proceeding?

A As a part of my teaching, I felt that in the work I do in consulting, that I should acquaint engineers, particularly those about to go into engineering practice, with what is expected in these areas. They are going to be affected by it. I have devoted some time to preparing information for the classes that I teach, along these lines. In some cases, the work I have done there has been of interest to other people in various areas.

Q Have you not spoken to bodies of lawyers and insurance adjusters concerning this topic?

A Yes, I have.

[1844] Q (By Mr. John Varda) And do you advertise, sir, your consulting services to lawyers?

A No, I do not.

Q Do you advertise your consulting service in Iowa?

A I may be listed in one lawyer's reference that I can vaguely remember, but—No, I don't advertise. It is well known in at least this area that I am available for engineering consulting, but I have never advertised.

Q Would you be listed in bar bulletins, and that kind of document, and advertisements?

A Not because of anything that I initiated. There may be some lawyers who have mentioned me, but it is certainly nothing that I did.

* * * *

[1848] Q You specifically addressed yourself to the subject of twins in making this study, and made no comparison with semis, is that correct?

A That is correct.

Q And isn't it true that you have made the observation with respect to the complaints that you found of vehicles coming off the road at the Akron terminal that there was no significant difference between complaints about twin and semi power equipment?

A Was that in my deposition, or is that on this morning's—

Q Could you answer the question, sir?

A I don't recall whether I have made that statement. I do recall I see many of the same problems on twins that I would expect to see on semis.

[1849] Q Sir, if you made the statement, as a statement of your opinion, that there was no significant difference between the twin and semi power equipment, would that have been a correct statement?

A I cannot remember making that statement, first of all. Secondly, it couldn't be correct—totally correct unless I had reviewed the semi complaints also, and my attention was focused on twins at that time.

Q So any statement you would make with respect to differences between twins and semis with respect to complaints on maintenance would be a matter of speculation?

A Well, I would certainly have nothing to base that on based on what I have seen.

Q Do you recall testifying at Page 54 of your third deposition, "Well, as I recall, I found a couple of rather spectacular complaints on the tandems that did not appear on the twins, but I found nothing significantly different in the types of complaints that were made"?

MR. PAFF: What page are we on?

MR. JOHN VARDA: Page 54.

Q (By Mr. John Varda) That was your testimony, was it not, sir?

A Yes. I believe I asked where that was in my deposition earlier.

* * * *

[1851] Q Now, you have made some observations this morning concerning passing distances. Have you ever conducted a study of how passing is actually effected in the traffic stream?

A I have done such a study in my own driving.

Q Have you ever done a formal, systematic, organized type of scientific study of the subject?

A Not as such, no.

Q Do you know whether people in the field of highway safety engineering have conducted such studies?

A I don't know of my own knowledge whether they have or not.

Q Did you review any such studies in connection with preparing for your testimony in this case, and making the observations which you have made concerning passing?

A I don't recall that I did.

Q Really, the statements that you made on your direct testimony were simply a matter of calculating differences in time and differences in distance in a mathematical way based upon the speed differences that you provided?

A That's what I did.

[1852] Q There is no testing or studying or measuring which would be a basis for your making any conclusion about whether that's actually the way things happen in the real world?

A Well, I know that passing varies from that in the real world and, generally, on the side of longer lengths rather than shorter lengths of time.

Q And what is the basis for that observation?

A My driving experience.

Q You have reviewed no literature in the field, have you?

A That is correct.

Q You would not know then, sir, whether the literature in the field would be consistent or inconsistent with your personal driving experience?

A Well, if it is inconsistent, it certainly dosen't fit what I have seen and observed and performed myself on the road.

Q Do you consider yourself an expert in the field of analyzing the way passing occurs in the real world?

A Well, in what I have observed, yes, due to my professional background.

Q Did you review certain literature related to the splash and spray characteristics which you discussed in your direct testimony?

A I have read it, yes.

[1853] Q Can you indicate what part of the literature you read?

A I did not study it in depth, but I read through the entire pamphlet at one time or another, the Western Highway—I believe it was the Western Highway pamphlet on splash and spray.

Q Is this pamphlet you are referring to your conception of what the literature in the field of commercial vehicle splash and spray consists of?

A Well, I have no knowledge of anything other than what is listed in the biblography and what is included in that particular pamphlet.

Q Well, I thought you made some type of search of the literature in the field in preparation for your testimony here.

A Well, I don't believe that my testimony included splash and spray, except being beside a 65-foot unit while passing.

Q Well, sir, would it not be relevant to the observations that you made as to whether the 65-foot twin trailer combination generates more or less splash and spray than the 55-foot standard semi combination to which you compared it?

A No, it would not.

Q How have you reached that conclusion?

A Well, the intensity, once it gets above a certain point, is immaterial, and the certain point is at what point [1854] the windshield becomes fogged or covered with whatever is being blown around, whether it is splash and spray or snow, and as soon as the vision is obscured by a small amount even, then relative differences, in my opinion, don't make that much difference. You are still in a zone where your vision is obscured, and the fact that one truck produces 10 percent less than another truck is really immaterial, because I can't see with either one of them.

[1855] Q (By Mr. Varda) Do you know whether the zone of splash and spray on a twin trailer 65 feet in length is longer or shorter than the zone on a semi?

A It would be longer than the zone on a 55-foot semi.

Q And have you conducted any credible scientific study to support that observation?

A The laws of nature indicate that that would be the case, without any scientific study.

Q So this is simply a product of your logical and inductive reasoning, rather than any specific study of it?

A My background experience.

Q Do you know whether the splash and spray generated by a 65-foot twin trailer combination is any wider or less wide than that generated by a 55-foot semitrailer combination?

A I do not know. Again, I did not—As long as the splash and spray gets over on the windshield, the width doesn't make any difference, unless it can be confined exactly to the vehicle.

Q Do you know whether the splash and spray of a 65-foot twin trailer combination, as compared to a 55-foot semitrailer combination is in fact lower?

A No, I don't. Even with the smaller cars we have it's still a problem with the vehicles that are driving along with the unit.

Q You would make that observation, not knowing how much [1856] lower the pattern of splash and spray might be from a 65-foot twin trailer than a 55-foot semi?

A Unless it's kept down very low—and my experience tells me it is not kept down that low—it's still going to be a problem.

Q And you made, in your direct testimony, reference to the action of a windshield wiper on an automobile concerning splash and spray and snow blow, did you not?

A Yes, I did.

Q Isn't it a fact the intensity of splash and spray would affect the effectiveness of windshield wipers in responding to it?

A Well, the volume removed would, but if you're in a cloud of splash and spray and have it available all the way along it, it really doesn't make any difference. The vision is still obscured. Even with the windshield wiper working, it's not what it would be if there is no splash and spray.

Q Have you made any credible scientific study of that element of your testimony?

A I have made no study, other than my experience.

Q Isn't it a fact that the subject of splash and spray is one that has been scientifically studied, and people have seen fit to study it, rather than generate their observations from the laws of nature, as you say?

A Well, the reason, in some of the literature I have [1857] read, indicates it's because they're trying to eliminate it, because it is a problem, as I have described, and have observed.

Q Sir, can you answer the question I asked?

A Would you repeat it, please?

(Next-to-last question read by reporter.)

THE WITNESS: Well, the "rather" bothers me. I believe they are doing both, in my estimation.

Q Scientific studies have been done, rather than relying upon observations of the driver, have they not?

A The driver of which? The driver of the car?

Q The driver of the automobile.

A The studies that I have—The scientific studies that I have read do not indicate having a driver in an automobile at that point, no.

Q Now, you referred in your review of the field as relating to some pamphlet. What pamphlet was that?

A I believe it's the Western Highway Institute splash and spray test.

Q Do you recall where those were conducted?

A I think they were Madras, Oregon; Port Stockton, Texas, and there was a third one, but I don't remember where it was.

Q And you found no splash-and-spray literature sponsored by any organization, other than the Western Highway Institute?

[1858] A Well, there is a bibliography in the back that lists other splash and spray work.

Q Isn't it a fact that Thurman Sherard, one of the witnesses in this proceeding, is a recognized expert on the subject of splash and spray testing?

MR. PAFF: I object to what Mr. Sherard is, if you're going to offer his deposition. It speaks for itself.

THE COURT: I think this may be answered. Goes to his qualifications.

A I do not know whether Mr. Sherard is an expert in that area or not.

Q Your review of the literature in the field doesn't disclose one way or the other to you?

A He's listed as participating in that work. I do not know what his qualifications are.

Q Would it stir your recollection if I mentioned the Southwestern Research Institute as an organization involved in splash and spray studies, and the literature on that subject?

A I know of the Southwest Research Institute. I do not know if they have conducted studies, as such. I did not make an intensive study of splash and spray literature.

Q So really, if we can summarize this, you didn't do any scientific tests, and you are, with respect to splash and spray, relying on your background and basic knowledge and your own personal observations?

[1859] A That's correct.

Q How many 65-foot twin trailers did you pass under splash and spray conditions to prepare your observations for this proceeding?

A None specifically to prepare my observations for this proceeding.

Q And how many 65-foot auto carriers have you passed in splash and spray conditions to prepare your observations for this proceeding?

A None.

Q How many 60-foot twin trailers have you passed in splash and spray conditions to prepare your observations for this proceeding?

A None specifically to prepare my observations; just ones in my general travel.

Q And do you have any record in your observations, in your general travel, as to the number of units, the nature of the conditions in which you passed the vehicles?

A No, I do not.

Q Is there any scientific control of the various conditions in which you may have passed the vehicles so that you could derive some comparative information with respect to vehicle types?

A No, there is not.

Q Did you review the 1975 Iowa DOT study concerning [1860] twin trailers in connection with the preparation of your testimony in this proceeding?

A I have read it, yes.

Q And do you recall that in that document a section was provided discussing passing distances?

A I recall that, yes.

Q And do you recall whether the discussion of passing distances in the table provided recognized that vehicles accelerate—continue to accelerate through a pass, as opposed to moving at a constant rate of speed?

A I recall that it said that. That has not always been my experience.

Q And do you recall who the authority for that information was?

A No, I do not.

Q Would the name F. C. Turner, Federal Highway Administrator, stir your recollection?

A That name is not familiar to me.

Q With respect to your consideration of the nature of passing, did you review the literature available on passing times and passing distances, per se?

A Not per se, no.

Q Is there literature in that field?

A I would assume there is. I don't know for a fact.

Q Would that literature be more related to the field of [1861] highway safety engineering than the field of mechanical engineering? Is that why you wouldn't know it?

A I can't say. I haven't seen it.

Q In connection with the passing distances that you gave—I believe you had three sets of calculations—can you indicate the total distances with respect to the 10-mile difference, the five-mile difference and the three-mile difference that you measured?

A I did not calculate those.

Q Do you have any idea what the total distances for the passing maneuvers would be in those situations?

A Not without reference to—I think there would be some total distances listed in the Iowa study, but I don't recall at the moment what they were.

Q Would it refresh your recollection, referring to Page 60 of Exhibit 2, the 1975 Iowa DOT study, at accelerated speed differential, the difference is 1,377 feet and 1,397 feet, or 20 feet in total difference?

A What were the conditions that went along with those?

Q That's an increase in length of five feet, from a 65-foot vehicle to a 70-foot vehicle.

A Could I see that table?

MR. JOHN VARDA: Sure.

THE COURT: We will take our morning recess at this time.

(Short recess.)

[1862] THE COURT: Proceed.

Q (By Mr. John Varda) Sir, over the recess, did you have a chance to look at page 60 of Exhibit 2?

A I did.

Q And did you do any calculations concerning the distance in feet and time for the speeds that you gave in your testimony with an accelerated acceleration during the passing?

A No, I did not.

Q Now, sir, do you know what part of the passing maneuver is regarded as the most significant in terms of the safety of the maneuver?

A The most significant in my mind at the moment would be the observation of what was ahead before the passing was started.

Q And where is that significant?

A Significant anywhere that you're going to pass.

Q Is that most significant on a two-lane facility?

A It is very significant on a four-lane facility also.

Q Isn't it recognized in the field as much more significant on a two-lane than a four-lane facility?

A Well, there are more things that can happen on a two-lane, but on a four-lane, if you have a slow car in your lane ahead as you are starting to pass the vehicle, it is a problem also.

Q Isn't having a vehicle coming in the other direction, [1863] as opposed to a slow-moving car ahead of you, a more significant problem in the passing maneuver?

A They are both problems. It depends on how fast we were going and where we are.

Q Let's go back to the original question. In connection with the passing maneuver, assuming the observation, what is the most critical portion of the maneuver?

A I thought I had just answered that. It is the observation of what is ahead.

Q Assuming we have made the observation, what is regarded as the most critical part of the physical maneuver?

A Well, everything from that point on is very critical; getting out into the other lane and proceeding alongside whatever it is you are passing.

Q What is the relative significance or criticalness of the maneuver into the passing lane and the maneuver back to the driving lane as compared with the time spent alongside the vehicle passed? Let's look at it on a four-lane divided highway.

A Well, you don't want to spend any more time than one has to alongside anything that is being passed. You want to get into the flow of traffic, so it would be getting out of the other lane rapidly, proceeding through and getting back into the original lane.

* * * *

[1864] Q What is the relative significance of the length of the vehicle as compared to the maneuver in to and out of the passing lane as recognized in the field of highway safety engineering, or level of service analysis?

A Well, in those areas—I guess that is where I have a small problem, because in those areas, whenever you are making an analysis, you are looking at ideal situations, or canned situations, which are defined, and that's not what occurs on the roads. What occurs on the roads is what is happening at that moment, and it is a random type of situation. Therefore, canning it and treating it from that standpoint, I have trouble with, in saying, "This is more critical than that", because when I get on the road, I can be in trouble alongside a vehicle if it swerves a little bit.

Q Wasn't your calculation with passing times and distances essentially canned?

A Yes, it was.

Q And do you regard level of service analysis of highway facilities as kind of a canned analysis?

A I guess I am not familiar with that exact term.

Q Now, sir, with respect to all of your statements on the subject of passing, can you indicate what distinction you [1865] would make between the 65-foot twin trailer and a 65-foot auto carrier?

A Well, for one thing, the 65-foot auto carrier is really only 60 feet long, and unless you are driving a very high vehicle, the overhangs are such that they are not going to interfere any more with the passing than a 60-foot vehicle would.

Q Would you have the same observation with respect to tractor haulers and boat haulers?

A Well, it depends upon what height the overhang is.

Q Would you know whether there is any difference—Strike that.

How would the problem that you observe with respect to passing a 65-foot twin trailer be any different on sections of Interstate 80, for example, going through the urban section in Council Bluffs, or Bettendorf and Davenport as compared with other sections of the interstate facility?

A I would expect more vehicles in the urban sections than I would out on the road.

Q So the passing situation would be more critical in the urban sections, would it not?

A It would be, although for any given case, even if there is only two vehicles, it can still be an extremely critical passing situation.

Q As a general observation of safety, as you would [1866] observe safety, the more vehicles associated with the passing situation, same general vehicles, or whatever, the more concern you would have about a 65-foot twin trailer being in the traffic mix?

A Yes.

Q Are you aware of whether or not 65-foot twin trailers are permitted to operate on the urban sections of Interstate 80 in Council Bluffs and in Bettendorf and Davenport? [under the border cities exemption]

A I don't know that they are.

Q Now, sir, you gave some testimony on direct concerning braking, and on this subject you made reference to the Utica and Virginia studies.

A That is correct.

Q Do you know, sir, whether the Utica and Virginia studies involved twin trailers equipped with fast air transmission valves?

A It is my recollection, at the beginning at least, some of them did not have fast air transmission valves.

[1867] Q (By Mr. John Varda) Isn't it true that * * * none of the vehicles tested in the Virginia study and in the Utica test at any time had fast air transmission valves?

A I would have to review those reports before I could say that. It's my recollection that some of the vehicles did have fast air transmission valves, and that quite a bit of time, particularly was spent at Utica, in reducing the transmission time of the valve.

Q Would you know whether the modification only involved brake balancing?

A My recollection is that they also involved timing.

* * * *

[1868] Q What is the basis of that observation?

A One reason is the amount of work that's done in getting balanced braking. The amount of test work that has been done in torque balancing and in timing of application both—they're very crucial, according to the amount of time and effort that's been spent on it.

* * * *

[1869] Q Now, sir, maybe you can check at a better point and [1870] see if you can't confirm that none of the vehicles involved in the modifications in the Utica test had fast air transmission valves, and give us that answer at a later point. We can go on, however.

I would like to ask you, isn't it a fact that the installation of fast air transmission valves improved braking of twin trailer combinations?

A Yes, it did.

Q And isn't it a fact that the fast air transmission valves are basically standard on twin trailer combinations today?

A I cannot answer what other people are doing on twins.

Q You don't know what braking systems are standard on twin trailers today?

A Well, I'm not certain there is such a thing as a standard system, because each manufacturer-user orders the system to match their own requirements, and so that it will meet the Motor Vehicle Standard 121 requirement, and I do not know whether the 121 requirements require that there be a fast air transmission valve.

Q Isn't it a fact that the twin trailers of today meet the 121 requirements?

A That is my understanding.

Q And isn't it a fact that twin trailers equipped with fast air transmission valves meet the 121 requirements without [1871] the modifications that are required by 121 to both semis and twins?

A That I'm not sure about. I don't recall seeing that reference.

Q Did you see it referenced anywhere with respect to the review of the materials in the case?

A There was no question but what the twin unit met the 121 standards. I don't recall what had to be added, if anything, to meet the 121 standards, and I don't recall whether the fast transmission valve was required in order to meet it or not.

Q Isn't it true that in reviewing the Utica study today, that only the modified test would be of any relevance to the operation of twin trailers in the real world?

A No, I don't think that's true. If we're talking about the real world, and comparing that to what was done in the Utica test, the Utica tests were run with equipment that was specifically tuned and set up to have balanced braking and torque balance on the wheels. I do not have an indication that all trucks on the road, or all twins, for that matter, have the balanced systems. There are people maintaining them, there are people assembling them. There are manufacturing tolerances that are involved, and I don't know what all of them are, or the standards used in the Utica modified area.

[1872] Q (By Mr. John Varda) Isn't all of that simply a matter of speculation?

A No, sir. It is more than speculation. It is a matter of looking at equipment as it has been received from manufacturers over the last 20 years, and noting what the difference is between what is designed and intended, what is used in testing and what actually comes out the door and is put on the road.

Q What specific study did you do to support that statement in connection with your testimony in this proceeding?

A Well, over the past 20 years, I have looked at tractors. I have looked at automobiles. I have looked at trucks. I have looked at over-the-road earth-moving equipment, and I see what was intended, and then I see what was actually put out, and there are units that have all the good intentions, but are simply not built the way that they are intended.

* * * *

[1874] Q And did you disagree with the conclusion reached below, with respect to stability, which reads as follows: "With regard to stability, the two units were about equal."

A I could not disagree with that one at this moment, based on the information I have.

* * * *

[1875] Q What information—and I mean what study data, test data, similar type of information—do you have to support your disagreement with the conclusions of the Virginia study with respect to stopping distance?

A Well, in looking at the data, as presented in Table 3, and in looking at—

THE COURT: Table 3? What page?

THE WITNESS: That's Page 82, Your Honor. —at the data as plotted on Pages 83, 84 and 85, I note that of the 96 tests—of the 26 tests, for 19 of the tests there was a lower comparative average for the conventional semi rather than for the twin, and what I did there was compare the numbers under stopping distance for a conventional trailer and the numbers under twin trailer for stopping distance, and noted the ones [1876] in which the conventional had a shorter stopping distance than the twin.

Q Can you give us some of those differences that you noted?

A Okay. Any difference at all, I noted, so in the first line, under "20 mile an hour wet surface condition", the the conventional stopped in 33.8 feet. The twin trailers stopped in 35.2 feet. Under the "half-loaded condition", the conventional was 30.7 feet. The twin was 30.8 feet.

Q Now, that's a difference that you are noting, in support of your observation, of one-tenth of a foot?

A Yes. It is a difference.

Q Do you regard that as significant?

A Practically speaking, a tenth of a foot is not significant, but the significant thing, in my opinion, is the consistency of the 19 out of 26 being lower. The data is rather consistent.

Q Have you run any tests of statistical significance on that data?

A No, but I did read on Page 79 in the first paragraph there where it said the—"Under test results, stopping distance, the trailers were compared 26 times and found to have significantly different stopping abilities at the 95 percent level on seven occasions, or one-fourth of the time. In six of the seven cases where significant differences were shown, [1877] the twin had the greater stopping distance, while under one set of conditions the conventional had a greater stopping distance. Also of interest is the fact that in five of the seven cases where a significant difference is shown, the test section was dry. The significant difference at the 95 percent level means that one can be 95 percent confident that the trailers perform differently under a specific set of test conditions."

Q What is the practical significance of the data compared to the statistical significance?

A The practical significance and the consistency of the data here does not indicate that they are—does not, in my opinion, justify a conclusion that there is no significant difference. What it does indicate, in my opinion, is that much more work needs to be done to establish whether they are the same or not.

Q What work have you done?

A None.

* * * *

[1882] Q Did you seek out literature in this field in connection with jackknifing, and in the course of your preparations for your testimony in this proceeding?

A I did.

Q Isn't it correct that at your final deposition on May 23 [30 days earlier], you were unable to provide your opinion with respect to [1883] the relative jackknifing of the semi and the twin units?

A That is correct.

Q And isn't it a fact that at that time you indicated that the only source that you had not yet reviewed, and which you desired to review before expressing your opinion, was the deposition of Professor Easton, and the test results that Professor Easton provided, which was involved in connection with the National Safety Council testing of vehicles on slippery surfaces?

A That is correct.

Q And does your opinion with respect to the jackknifing characteristics of semis, compared to twins, again differ with the conclusion of the literature to which you referred?

A Yes, it does.

Q Is it the conclusion of the report on jackknifing of articulated vehicles on slippery surfaces, February, 1972—

THE COURT: Does that have an exhibit number?

MR. JOHN VARDA: This is Easton Deposition Exhibit 7.

Q (By Mr. Varda) Continuing—conclude that the general conclusion then is safety of the 55-foot tractor semitrailer and 65-foot trailer combination is not significantly different?

A That is his conclusion.

Q That is the conclusion of his report, is it not?

A It is.

[1884] Q And was Professor Easton's conclusion predicated on test results based upon tests which he conducted under the auspices of the National Safety Council?

A Yes, they were.

Q Were those tests conducted over a long period of time?

A Yes.

Q Have you, in connection with the preparation of your testimony in this proceeding, in fact conducted any tests with respect to the jackknifing characteristics of semis and twin trailers?

A No, I have not.

Q Do you have an opinion, sir, with respect to any differences in jackknifing characteristics between 60-foot twin trailers and 65-foot twin trailers?

A My opinion is there is probably not a great difference.

* * * *

[1891] Q Are you here to give and do you have any opinion as to the overall safety of 65-foot twins compared to 60-foot twins?

A I cannot answer that in an overall broad system. I don't think it has been established as to the relative safety. I am here to point out safety considerations in the operation, as I have testified, and that's all that I am to provide opinions on.

Q Well, you have not pointed out any—Strike that. Do you have an opinion as to the overall safety of the 65-foot twins compared to 60-foot auto carriers operating with overhangs to 65 feet?

A No, I do not.

Q And do you have an opinion as to the overall safety of 65-foot twins compared to 55-foot semis?

A No, I do not, other than what I have testified to as the potentials and safety considerations.

Q And all you have testified to, sir, are potentials, are they not?

A That is correct.

[1892] Q And you have done no testing of what the relative significance of those potentials may be?

A Well, some of them are obvious enough that testing is not required to establish those potentials, but I have done no testing, that is correct.

* * * *

[1896] DONALD E. WANDLING,

called as a witness by the Defendants, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PAFF:

* * * *

[1897] Q And what is your occupation or employment?

A I'm a consulting engineer.

Q And how long have you been engaged in the consulting engineering business?

A I've been engaged as a consulting engineer since about 1966, but full time in that capacity since 1975.

Q And do you own your own consulting business with regard to that activity?

A Yes.

* * * *

A I would provide services for lawyers, insurance companies; I would provide services for manufacturing concerns. I could list a few of those manufacturing concerns. * * *

* * * *

[1904] THE WITNESS: The Michigan double-bottom consists of a tractor, a second trailer, a dolly and a trailing trailer; four units. The Michigan double-bottom tanker—The Michigan double-bottom that we're talking about in this instance was a tanker for the haulage of petroleum products, and it had 11 axles, instead of five.

Q (By Mr. Paff) And how much did the vehicle weigh?

A 152,000 pounds was the approximate gross vehicle weight of that vehicle unit.

Q And what was the overall length.

* * * *

A Okay. Referring to Exhibit 550, on Page 4, a description of the Michigan double appears there. The overall length of the double is 55 feet.

Q How about the height, and so forth, and those particular dimensions?

A The height of the trailing trailer is 13 foot, three [1905] inches. The height of the trailer directly behind the tractor is somewhat lower than that; 12 foot, eight inches. The effective—The trailing trailer has three wheels on the rear of the trailer and two wheels on the dolly. The trailing trailer has a total of five wheels. The effective wheel-base of that trailer is 10 foot, five inches. The lead trailer has an effective wheel base of 175.5 inches, and the tractor has a wheel base of 136.5.

* * * *

[1930] Q Now, Mr. Wandling, in regard to your study of the various documents and the studies of the Michigan experience and the papers presented there, could you express an opinion as to the relative stability between articulated double-bottom vehicles and the traditional tractor-trailer semi?

A Yes.

Q What is that opinion?

A My opinion is that the double articulated vehicle is less stable in yaw stability than the conventional semitrailer by a factor of about half.

Q And with regard to the amplification of motion on the second trailer, would that condition be present both in the 60-foot double and the 65-foot double, and not be present in the tractor-trailer semi configuration.

A That is correct.

[1931] Q Now, based upon your analysis and your reading of the documents in this particular proceeding, did you form an opinion with regard to the roll-over characteristics of the double-bottom vehicle as compared to the 55-foot semi?

A May I have that question back?

(Question read by the reporter.)

THE WITNESS: Yes.

Q (By Mr. Paff) And what is that opinion, sir?

A My opinion is that the amplification of the acceleration level on the rear trailer produces conditions where roll-over is more likely on the double than the conventional unit simply because the operator experiences one acceleration level and the trailer is experiencing a higher one.

MR. PAFF: Your Honor, at this time I would like to introduce Defendants' Exhibits 549 and 550 and 551, which is the movie of the test results of the Michigian film, and we would offer those at this particular time.

MR. LEDERER: Your Honor, we maintain our objection to the film. It is quite obviously dealing with substantially different vehicles here. None of the evidence produced here has indicated that a 65-foot twin that we are dealing with in this case is the same as this vehicle. I believe the witness testified that he wasn't sure what the relative stabilities of the two were, whether it might be twice as much, or half as much, or whatever, and I think it is prejudicial [1932] to show a film of this nature, of a vehicle known to be badly unstable, and would create an implication that the same exists for other vehicles, which has not been so shown.

THE COURT: Well, I had indicated that, again, I would take this subject to the objection. * * *

* * * *

[1933] CROSS EXAMINATION

BY MR. LEDERER:

* * * *

[1936] Q Have you calculated what the amplitude is for 65-foot van type twin trailers?

A I have not calculated it, and I know of no studies in that regard at all. It would be very beneficial to have those studies.

Q Did you review all of the literature in this study?

A Well, I reviewed all that I could find, and I would say yes.

Q Did you review a document entitled "Stability and Handling Criteria of Articulated Vehicles, DOT HS-800 915," and has a contract number on it, and was prepared for the U.S. Department of Transportation by Eshelman, et al.?

* * * *

[1937] A I'm sorry. To the best of my knowledge, I have not read that.

Q Are there numerous factors that affect both the stability of a vehicle—in the case of a double-bottom vehicle, or in the case of semitrailer—and the amplitude of acceleration when it goes through a maneuver?

A Yes.

[1938] Q Do those factors include such factors as the gross vehicle weight, the number of axles, the height of the center of gravity, the length of the tongue of the dolly, the overhang—in the case of a double trailer—of the second trailer, the distance between the rear axle on the semitrailer van and the pintle hook, the wheelbase of both the lead trailer and the second trailer?

A I'm going to try to answer that, but I'm going—

Q I think you can answer that question yes or no. Are those all factors that affect the stability of the vehicle?

A That affect the stability? I would say they are all factors that would go into the describing equation, yes.

Q And variations in those factors would vary the stability of the vehicle, would they not?

A They would vary—They would vary the components of the characteristic equation, and they do vary the stability, yes.

[1939] Q (By Mr. Lederer) And have you determined what any of those factors are for a 65-foot twin?

A What any of those factors are?

Q What their actual physical measurement is.

A I believe that there is some information in the truck manufacturer's bulletins on the length of the wheelbase, and so forth, which is standard—excuse me—which is their recommendation. Now, whether particular manufacturers vary those lengths, I don't know.

Q Did you put any of those factors into calculations to determine what the stability of the 65-foot twin trailer is?

A No.

Q And would you suspect that in each of the factors that I name, there would be a marked difference—or at least a difference. I won't say marked difference—a difference between those parameters as they are measured for a 65-foot trailer and the parameters of a 55-foot Michigan tanker double-bottom?

THE WITNESS: May I have that question read back?

(Question read by the reporter.)

THE WITNESS: I would say that there would be a difference in the parameters.

Q (By Mr. Lederer) Did you measure what the size of the difference would be?

A No, I did not, but I've yet to have been given the specific sizes that such a double would have to be manufactured to.

[1940] Q Who did you expect to give these to you?

A What did I expect to? I don't know that I had an expectation that anyone would, but now that you have asked the question, I suppose I would have expected that you would—or your group would.

Q Did you at any time request from us any of these parameters, or did you at any time go to the literature to determine any of these parameters?

A Yes.

Q You did request from us, did you—I asked my double question again. Pardon me.

Did you request any of these parameters, again, from us?

A Well, I don't recall that I ever requested from you particularly, but I believe I requested from my counsel those kinds of figures.

Q And did he not give them to you?

A He did not.

Q So you were unable to calculate what the actual stability for a 65-foot twin trailer vehicle was, is that correct?

A Well, when you say—I believe that that is correct. I did not run an analysis, for example, of the characteristic roots, per se, of a particular 65-foot unit.

Q As you, for instance, increase—You are looking [1941] at, say, twin vehicles in general. As you increase the wheelbase of the trailers, what effect does this have on stability?

A On yaw stability?

Q Yes, sir.

A I think as you increase the wheelbase, you would have a tendency to increase yaw stability, other things being held constant, * * *

* * * *

[1948] Q And since you have not been able to determine the parameters in calculating the stability of the 65-foot twin trailers, you have no quantitative way of comparing a 65-foot twin trailer with a 55-foot semitrailer, is that correct?

A We do have a quantitative way for comparing the 65—I said "quantitative," and I probably should have said qualitative—qualitative way for comparing the 65-foot double unit with the 55-foot van standard semitrailer, and that is in—the analysis of the Michigan analysis did that, in terms of the 65-foot double tanker.

Q But a 65-foot double tanker would have different parameters than a 65-foot twin, correct?

A It would have different parameters than a 65-foot, yes.

* * * *

[1949] Q It is a matter of speculation on your part, is it not, what the actual stability of a 65-foot twin trailer is, if you don't know the parameters?

A Well, I have not—It isn't speculation on my part because I haven't tried to tell you what the stability of a particular 65-foot van is. If I did try to tell you that, I think it would be speculation on my part, yes. I'm sorry. Obviously unless we define more parameters, and do something else—Okay?

Q In your earlier—

THE COURT: You did sort of quantify this, though, Professor Wandling. You said that the twin was less stable in the yaw mode of motion than a semi by about half.

THE WITNESS: Yes. And I base that upon—I don't remember the table now, but upon the data presented in the analysis sheets which compared the two.

[1950] THE COURT: Then you are comparing the two? You are comparing the tanker—

THE WITNESS: I'm comparing—What I am doing is comparing it to the five-axle van type semitrailer.

THE COURT: Comparing the Michigan tanker?

THE WITNESS: The 55-foot double and the 65-foot double Michigan unit.

THE COURT: If you say that the 65-foot Michigan tanker is less stable by about half than the semitrailer—more stable than the 65-foot—

THE WITNESS: Double.

THE COURT: —twin that we're dealing with here is than that tanker, your difference is reduced?

THE WITNESS: That's correct. No—that's exactly correct. If the van is more stable than that, then that difference is reduced; and the difference we're talking about was the difference in damping ratios, really.

THE COURT: Is in what?

THE WITNESS: Is in damping ratios. That's where the factor of two came in, and the table indicated all the articulated vehicles looked at had a damping ratio of about half of what the semi van was.

Q (By Mr. Lederer) Do you know whether or not a 55-foot semitrailer is more or less stable than a 65-foot twin trailer?

[1951] A In terms of yaw stability?

Q In terms of yaw stability.

A A 55-foot?

Q Van type semi.

A Is more—is more stable than what?

Q Do you know whether or not a 55-foot van type semitrailer, five axle—the type we're dealing with in this case—is more or less stable than a 65-foot five-axle van type twin trailer of the type that we're dealing with in this case?

A I'm sorry. Twin trailer?

Q Twin trailer; the type that Mr. Paff has brought a model of.

MR. PAFF: I asked him for a model first, Your Honor; this is what I ended up with.

THE COURT: It's cute.

THE WITNESS: I would say this: That I think in all probability that the 55-foot van is definitely more stable than the articulated vehicle. Now, all of the data that I have looked at has all of the roots associated with the rear trailer to the right of the tractor semitrailer. My own knowledge of physical systems, and all my experience, tells me that when I add that trailer back there with the dolly and add the two joints of articulation, there is not any place to get the damping—and that's going to be produced; so since I haven't seen the studies, I must tell you that I don't have any data [1952] that actually quantitatively compares the two, but I believe the data that we do have strongly shows—indicates—I should use "indicates" rather than shows—that the 55-foot standard trailer is running in a damping ratio of from .5 to .8, and all of the twin units are running from the .2 to .3.

Q But all the twin units we are dealing with in that data are—if I'm not mistaken—tankers, 65 foot and 55 foot in length, that have shorter wheelbases, higher centers of gravity, higher gross vehicle weights, different measurements throughout the vehicle, do they not?

A Could I have that question again?

(Last question read by the reporter.)

THE WITNESS: Okay. We don't know what the measurement differences are. We don't know—at least I don't know—whether the tankers are shorter in wheelbase than the unit. I would suspect they are not on the 65-foot doubles; but we do know that—I'm not telling you now that clearly the 55-foot double has a shorter wheelbase on the rear trailer, and so forth. We know that the vehicle weights, I would say, are different, and I assume lower, and we would suspect—I don't know about the center of gravity because the height of the 65-foot van is, as I recall, 13 foot 6, and depending on how you load it, the CG can sit somewhere in the 13 foot 6, and it is true, and the study indicates, that the Michigan tanker had, I think, a CG of the rear trailer of about 25 per cent [1953] higher, although I don't know higher than what, but I think it says in there.

Q So basically what you are saying, if I understand it correctly, is that you think that a twin trailer is less stable than a semitrailer, and the reason you think so is because—that would be your estimate—because you're adding another trailer on it?

A I'm not quarreling with what you have just said. I think that paraphrases what I have said; but there is more to it than that. We do have the analysis of the articulated vehicle, as presented in the one paper, and that does give us a start at making such a determination.

Q If there were analyses and actual experimental results of 65-foot twin trailers, 55-foot semis, 65-foot double-bottom tankers, 55-foot double-bottom tankers, would all of that data permit a more accurate comparison of the stability of these various vehicles than the process that you are going through? In other words, if that data existed, could someone make a more accurate estimate of the relative stability of these units?

A I think that if data existed on the 65-foot twins that you are wishing to run—if that data was available, that would give us a more accurate picture of stability than the data we have now, yes.

* * * *

[1954] Q Would a twin trailer then be—Are you saying a twin [1955] trailer is less stable when empty than when full?

A Yes.

Q And would that hold true for——that's both trailers empty, is that correct?

A What was that question?

Q That would be empty in both trailers?

A Yes.

Q Would that be true for a 65-foot twin of the type we are dealing with in this case?

A I would think that the tendency would certainly be there, but that would depend again on the particular parameters being used; but I would say the tendency is that that would be true, but that is a thing that would have to be tested to find out.

Q You don't know one way or the other?

A If a 65-foot twin empty is less stable?

Q It could be much, much more stable empty than full, or vice versa? You don't know the answer?

A I don't know the answer, but I would not—I would say that it would be improbable that it would be much, much more stable.

Q Is the 65-foot twin trailer van that we are dealing with here—is it closer to the semi in its stability characteristics, or is it closer to the tanker?

A Are you talking yaw stability, or are we talking [1956] what?

Q Let's talk yaw stability first.

A I would say that—Well, that we don't know. In terms of "closer", you're saying do the roots run farther to the left than something else? It is not—They do not run farther to the left than the single unit, so that they are not as stable as a semi. I would say that.

* * * *

[1960] THE COURT: Professor Wandling, could I summarize your opinion that comparing these two units that we have involved here is saying that, in your opinion, a 65-foot twin has less yaw stability and greater amplification of lateral acceleration than a 55-foot semitrailer?

THE WITNESS: Yes, sir.

THE COURT: Would you go further than that?

THE WITNESS: No, sir.

THE COURT: Thank you.

Q (By Mr. Lederer) When you said "No", you wouldn't go further than that, I assume what you are saying is you have no opinion as to how significant the difference may be?

A The difference between the van and the twin unit?

Q Yes.

A I think that's fair. I think that based on the [1961] present condition of the data that we have available and the present knowledge of the physical systems, that's about as far as I can go, except to say that as far as my work has been, those questions remain unanswered.

* * * *

[1966] THOMAS F. POGUE,

called as a witness by the Defendants, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PAFF:

Q Would you state your name, please, and spell your last name?

A My name is Thomas F. Pogue, P-o-g-u-e.

Q By whom are you employed?

A I am employed by the University of Iowa.

Q In what capacity?

A As a professor of economics.

* * * *

[1969] Q Now, how would you describe your task with regard to the present litigation, and when did you become involved in that?

A If I recall, my first contact with this particular case came through Mr. Lambert, and that would have been early this year.

My task, as I have understood it, has been to basically review the testimony given by witnesses, in particular Mr. Wrightson, concerning the economic costs that CF incurs as a result of the Iowa length statute, or the statute that limits the length of trucks.

I have not been asked to prepare independent estimates of this cost. I have simply been asked to examine the statements that have been presented and to look at the procedures that have been employed to generate those estimates.

Basically, in this review of their testimony, my assignment was to consider two questions. One is the question of whether the estimates that are presented or have been presented are appropriate as estimates of the minimum recurring annual burden associated with the length limitation statute.

The second question that I tried to come to grips with or deal with is given the existence of a burden of some magnitude, whatever that magnitude may be, is it significant for [1970] commerce and trade and for the financial viability of carriers, in particular CF.

My investigation or my task has been rather limited, strictly limited, in fact, to an examination of testimony as presented by the Plaintiff in this case.

* * * *

[1971] Q (By Mr. Paff) Now, how did you proceed then with your analysis?

A Okay. Well, I think one of the first things that one has to ask in considering something like this is the possibility of some burden or some cost incurred; and I'm satisfied, after looking at the operations or being familiarized with the operations of CF in discussing with their personnel the estimates that they have made of the costs that they associate with the [1972] Iowa limit, that it's very possible there are some additional costs incurred by CF; certainly in the year in which they estimated those costs, 1977, and probably continuing to today, as far as I'm concerned. That's not a question of importance.

I think the question that is important is the magnitude of those costs, and more importantly, their significance. It's hard to judge that magnitude in isolation, so what I have tried to do is look first at the procedure by which the estimated costs were obtained, and I have a few reservations about that which I will express.

* * * *

[1973] * * * Consequently, in a very general sense, one would have to say that the impact of this statute on CF's costs would be changing over time as traffic flows change, as the pattern of its operation changes, as it decisions about equipment types change, and so forth.

Now, let me give you a couple of examples of what I mean here. In connection with our—in our discussions with personnel at Menlo Park in February, we raised the question about the possibility of semis actually traveling across Iowa, rather than being diverted around Iowa, and discover that indeed when it is possible to match eastbound and westbound traffic, that they do run semis across Iowa rather than diverting them around Iowa. Now, the potential for this kind of matching depends on the extent to which semis are used in the system, and the extent to which semis are used in CF's system is changing dramatically—or at least it has changed dramatically in the last few years. One of the reasons, I think, is the fact of the growth of the company at the margin, the areas in which it is growing most rapidly, have been areas of the country in which 65-foot twin trailers are not yet—or are at least not legal.

* * * *

[1975] Now, what is interesting, I think, about this—and I'm sure that this is not something that I need to point out to CF, but I think it bears on the point that I'm trying to make regarding the interpretation of this cost estimate. The interesting thing here is that if you look for the high growth areas, the high ratio areas, you go down the column here; Birmingham, 3.3; Atlanta, 2.05; Charlotte, 2.28; and Newark, 1.93. All of those areas are in parts of the country which presently do not permit the use of double trailers. The other high growth area is Alaska, but it's a very small part of their total operations. So what I am saying is during the past few years, the pattern of operations of CF has altered, and it has altered in such a way that they are moving into areas that means they will utilize more semis, and this will, of course, over a time affect the number of semis operating in their system. It may affect their capabilities they may have for making these matches, which would then limit the amount of diversion of semis around Iowa.

In the cost estimate that they presented of roughly two million dollars, approximately 7½ percent of that, or $150,000, results because semitrailers are diverted around the State of Iowa. Now, this diversion is made, as I understand it, because of the location of their relay points. It's not an aversion that is directly required by law, of course, because those trailers could travel across Iowa, but they are diverted [1976] in the normal operation of CF because they need to have a driver available to pick up the semi and carry it on, and those relay points at which they change drivers are not located in Iowa at the present time.

* * * *

[1977] Q But so this is clear you have reviewed in your analysis both the original Wrightson testimony and the Wrightson testimony revised on April 30, is that correct?

A Yes, that's correct. I suppose the main point that I would be making in connection with reservations here is not so much again that there is—I am not doubtful about whether there is a cost. What I am saying is that the estmiate that has been presented is basically an estimate of the cost that CF incurred in that particular period of time. It has been adjusted only for a change in labor costs to reflect labor contracts for the year beginning on April 30 of 1978.

Because conditions do change—and the Exhibit 552 is merely to be an illustration of the nature of those kinds of changes. Because conditions do change, then we would expect that the nature of any costs that CF incurs because of this limit will change; and, consequently, my interpretation or my estimate would be that we could expect these costs to be either higher or lower in future periods than they were in 1977, [1978] and we don't really have, in that particular estimate, an estimate of the minimum recurring annual cost. We have basically an estimate of the costs that were incurred in that year, given the pattern of operations, conditions and so forth, of that year.

Whether one wants to project that and say that continues into the future really depends on the extent to which you think that conditions are going to change in a way that will alter the cost effects of Iowa statutes for CF, and they may or may not. That would be my main point.

* * * *

A (Continuing) $2 million, taken in isolation, for most of us is a big number, but that's not really the way to look [1979] at that kind of number.

If we are concerned about the implications of these costs for interstate commerce, if we are concerned about the implications of these costs for trade and commerce and for the financial viability of motor carriers, we need to look at them, and one way of looking at them and putting them into better perspective, in my judgment— We are looking at Page 24 now, where I will just take a number off of that in a moment.

* * * *

[1980] A Okay. I'm sorry. It is .336. What this means is that basically these costs that are associated or attributed to the statute represent less than one-third of one per cent of the operating costs of CF in that particular year.

To put it a little bit differently, if we were to [1981] imagine there having been no limit in that period and all other conditions were the same, CF's operating costs would have been less than one-third of one per cent lower because of the absence of the limit.

That's one way in which we can try to see how important that $2 million is. It is a big number for you and I, but it is a small fraction of CF's operating costs.

Q Did you compare those to other costs in other areas that were experienced by CF?

A Yes. I made two camparisons for purposes of illustration here today. What we can also ask is how does this cost that is imposed, presumably imposed on CF because of the limit, compare to other kinds of cost increases that the company experiences on a regular ongoing basis.

Q How did you obtain the cost increases?

A Okay. We have introduced, I think, as evidence the 1978 Fact Book prepared by CF, which gives historical statistics on its own performance and on other variables that are relevant for people interested in motor carrier activity.

Q What is a "fact book," sir?

A Well, this is just a compilation of statistics regarding CF's operations and the operations of the motor carrier industry. It was prepared by CF presumably for distribution to its stockholders. It is a very valuable summary of how the company has been doing.

* * * *

[1982] A (Continuing) In this Fact Book on Page 13 at the bottom of the page, there are some indices of cost and rates that have been prepared to illustrate how some of the factors—some of the cost factors that confront carriers like CF have changed over time, and also to illustrate how some of the rates of truck carriers, as well as other carriers, have changed.

What I did in trying to place the costs associated with the Iowa limit in perspective was note that during the period 1972 to '77, the most recent five-year period for which there is data in this table, that the trucking wages, which would be the next to the last column in that table, increased by an average annual rate of 8.1 per cent, so that each year during this period CF was confronted with a cost increase for one of its major raw materials, labor, of 8.1 per cent per year.

Contrast that with the .336 cost increase, one-time [1983] cost increase attributed to the Iowa limit.

In a similar vein, if we look at the last column of that table, we can calculate that for the 1972 to 1977 period, motor carriers confronted fuel cost increases, fuel cost-per-mile increases at the rate of 24 per cent per year, so another way of trying to put that $2 million and the associated costs, the costs associated with the limit in perspective, is to look at how it compares to other sources of cost increases, and it is clearly not a large increase in comparison to the increases that motor carriers experience and have experienced in recent years.

The prospect, unfortunately, I might add, as an economist—and I think many would agree with me—is that these kinds of cost increases are going to continue.

One might then suspect that any—Let me say that differently. Because it is such a small magnitude in comparison to these, there is a question of whether it would even be observable in the normal operations of the company.

THE COURT: What about the percentage of the net income? Isn't that a legitimate comparison?

THE WITNESS: Looking at this $2 million as a percentage of that income, that's a good question, and I think that it depends on who you are and what your concern in looking at this cost is. If your concern is with the impact of this cost on trade and commerce and on, ultimately, rates, [1984] which is one of the things that I want to talk about momentarily, then I think you want to look at it in relation to total costs.

From the point of view of CF and its shareholders, it is very clear that they are interested in how this $2 million relates to the profits of their company, and it certainly is a much larger percentage of their profits than it is of their costs, and we can put it a little bit differently.

As a stockholder, I wouldn't be indifferent about this magnitude. As a shipper—and we will get into this momentarily—confronted with higher rates that may be generated by this cost, I may not even notice. I am leaping ahead a bit here. I may not even notice the additional rate—the addition to rates that results because of this cost, and I think the relevant comparison for our inquiry today, of course, is in terms of its impact on shippers and the costs that they associate with the use of this mode of transport, because we are concerned with the effect on trade and commerce, and not with the effect on profits and the profitability and dividends to the stockholders of CF.

* * * *

[1985] Q Have you observed other documents, and have other documents been presented by the Plaintiff, that relate to the question of rates?

A Well, I can't speak for what other documents have been presented, but I have not seen testimony that gives any quantitative measurement of the ultimate effects of this cost on rates which would be paid by shippers. Let me comment on that, because I think that's very important; but before I do, I think to continue along the vein suggested by the question, if we look at these costs, we should recognize basically that [1986] there are two possible gainers, or groups of gainers, from eliminating the Iowa limit. Basically the gainers would be the stockholders of CF and the CF company, unless the resulting decrease in cost—whatever that decrease may be—is passed on in lower rates. So unless there is some mechanism which translates lower costs that would be generated by allowing 65-foot twins in Iowa—unless there is some mechanism by which that decrease in cost for CF would ultimately be translated into lower rates, the ultimate effect of this—of eliminating this limit, would be to improve the profits of the company and the dividends and income of the shareholders.

Now, to the extent that the reduction in costs for CF are ultimately through the rate-making process translated into lower rates, then the beneficiaries are shippers.

So it is really crucial, it seems to me, in establishing the impact of this legislation or this statute on commerce, to carry through and show how these costs changes that would occur if we eliminate the limitation would ultimately be translated into rate reductions for the shippers, which would then—other things being equal—make motor carrier traffic less costly, encourage commerce, et cetera.

I have seen, as a very disturbing aspect of the testimony, as I have seen it, the omission of this linkage and the omission of any thorough discussion of the linkage, and the omission, more importantly, of any quantitative estimate of the [1987] final effect of any cost reduction on rates, because the rates are the link between commerce and trade, on the one hand, and the statute and carrier costs, on the other hand. Unless we establish that linkage, we haven't established any kind—Unless we establish a linkage between rates and the statutes, we haven't really established a very firm linkage between the statute and commerce.

* * * *

[1988] Q (By Mr. Paff) So you found the linkage question to be still an important omission, is that correct?

A Yes. I find that a very important omission, and this led me to try to come up with some estimate that would give me a feel for how much of an impact the statute may have on rates, and I can go through some calculations now to illustrate that point.

* * * *

]2018] Q Now, could you summarize in two minutes what you have told us in two hours?

* * * *

A (Continuing) I really wanted to address the question [2019] of the quantitative significance of the costs that CF says are associated with this limitation, pretty much taking their estimate of their costs as given, with a few reservations, and what I have tried to do is, I think to show that in comparison to other costs of CF's, in comparison to its operating costs, these are small. In comparison to other cost increases that CF confronts and other similar carriers confront each year, these costs are small.

I have been concerned about the fact that the impact on costs associated with the ban, as estimated by CF, has not been translated into a quantitative estimate of the impact on rates, and I see this as a key linkage that needs to be spelled out; and in my own very uninstructive way I have tried to get some feel for what that magnitude might be in the absence of seeing any estimates in the testimony of CF, and that was my purpose in trying to work through the implications for average rates of passing on the full cost savings that CF would enjoy by its estimates to its customers, and that again was a small percentage, less than one-third of one per cent, so looked at either from the perspective of effects on costs, it is small, or the prospective or potential effect on rates, it appears to be small.

Then the other thing that I tried to address—and I think maybe less successfully because it is a much more complicated approach that is involved here—is that of the cost [2020] advantages of twins over semis and the magnitude of that cost advantage, and I am not denying the existence of a cost advantage. I am not denying the potential adaptability of twins to the type of traffic that dominates CF's—or is a large part of CF's traffic. What I am saying is that there are a number of bits of information in that testimony that suggest that those cost differences aren't large because they appear to be offset in the overall measures of financial and operating performance by other factors.

* * * *

CROSS EXAMINATION

BY MR. JOHN VARDA:

Q Professor Pogue, this is really the first occasion, is it not, in which you have addressed the subject of analyzing a motor carrier operation; is it not?

A That is correct.

Q You have indicated basically that you are unfamiliar with the ratemaking mechanism in this industry.

A I am not unfamiliar with it. I have been instructed in it to some extent by the deposition of Mr. Happer and by conversations with yourself and with other members of CF, so let's put it this way: I am not an expert on ratemaking, [2021] but I am not unaware of the broad procedures that are involved.

* * * *

Q A major portion of the discourse which you just gave us related to the significance of the calculative cost burden of $2 million, which you related in various ways to various statistics. First of all, did you have occasion to attempt to relate the $2 million, and the cost burden that CF calculated, to the actual traffic that's affected by the cost burden, that which is moving around Iowa or moving in semis rather than twins, and so on, in Mr. Wrightson's cost study?

A No, I did not.

Q Isn't it a fact that the added cost will have an effect on a regional basis as opposed to a nationwide basis?

A What kind of an effect are you talking about now?

Q Is the added cost, as a result of operating around Iowa, equally distributed among the various regional rate [2022] bureaus in the ratemaking process, or is it more concentrated in one as opposed to another?

A From my understanding, the added costs that are incurred would be—CF's costs, overall system costs are used by each of the ratemaking bureaus, but the costs are prorated among ratemaking bureaus, so that—Am I saying this correctly? When information on costs for ratemaking purposes is obtained from CF and other carriers, they look at system-wide averages for the various categories of costs, as I understand it, and then they give CF a weight in each ratemaking bureau that approximates the importance of that area in CF's operation.

Q So they use system average unit costs, and they relate it to actual traffic moving under the tariffs of the individual bureaus?

A As I understand it, yes.

Q So would the effect be that the added costs here, while they would be distributed as unit service costs systemwide, would be related to the traffic where CF has the traffic moving?

A Yes, but they would be, as I understand it, equally related. I mean they would be related to all bureaus roughly in relation to the traffic generating in each of those bureaus, yes.

* * * *

[2023] Q So what you are saying, in effect, sir, is that $2 million is a small figure because CF is a large carrier?

A I think what I am saying is that as a proportion of its operating costs, these costs are small. I think I said what I meant to say, yes.

* * * *

Q If I were a carrier operating between Chicago and Omaha transporting general commodity freight, and substantially smaller than CF, isn't it possible that the relative dollars for me in operating around Iowa with twin trailers would have a different significance?

A I can't speculate even on that. I haven't seen any estimates for what other carriers do and what their costs are.

Q Well, isn't the effect of the way that you have related the significance of the $2 million to say $2 million maybe is insignificant to a large carrier, and, conversely,

[2024] that maybe a similar calculation may be very significant to a smaller carrier?

A I haven't seen a similar calculation to make the comparison with. If there were a smaller carrier with costs of $10 million a year and there was an estimated cost, due to the ban, of $2 million, that would certainly be a whopper, yes, but I haven't seen any information on how other carriers are in fact affected by this limit.

Q I take it, sir, that you did not review the 1975 Iowa DOT study and its estimates with respect to operations of carriers other than CF?

A I did not review that study.

* * * *

[2025] Q Tell me how it is that you determined that the $2 million would be insignificant in the ratemaking process.

A Okay. What I did to try to get some feel for that—and I honestly wish that someone more conversant with the actual process had gone through this for me, but what I tried to do is as I explained. I said that if there was in fact a cost saving for CF of $2 million plus as a result of eliminating this length limit, and if in fact that should be passed on to shippers in the form of lower rates, then for CF, its [2026] revenues would have fallen by $2 million. Do you follow that so far?

* * * *

[2029] Q (Continuing) How did you determine that it was more appropriate to relate, in terms of measuring the significance of the $2 million, to relate it to total revenues and costs, rather than return on equity and profits?

A I determined that, from the point of view of the shipper, the customer of CF, it's more important to them what is going to happen to the rates they pay, and what is going to happen to the rates they pay on the average is determined by relating its revenues and the prospective maximum reduction in revenues that would result if there were this cost savings, and if the cost savings were fully passed on.

Q If you will allow me, this might clear this up a bit. Let me direct your attention to two short quotations from a docket of the Interstate Commerce Commission, decision and investigation of suspension, Docket M-29772.

* * * *

[2030] Q (By Mr. Varda) The first quotation, sir, is, "We"—meaning the Interstate Commerce Commission—"believe that the ROE"—return on equity—" is the most significant financial ratio because it is the return measure which the equity investor, who is the source of capital, will use in determining whether the motor carrier industry is an attractive place to invest capital. This conclusion is consonant with the recommendation of most economists testifying in this proceeding, that the Commission base a fair return standard on the cost of equity capital. Moreover, the ROE"—return on equity—"is widely used, easily understood, and relatively easy to compute."

Further in the decision, "The basic purpose of a rate of return standard is to determine the ability or inability of the carriers to absorb increased costs when measured against the standard. We conclude that a direct pass-through of cost increases by the carriers cannot be sanctioned by the Commission unless such pass-throughs are shown to be justified by the carriers' need for additional revenues in an amount necessary to achieve the rate of return standards set forth above."

[2031] Now, sir, in view of those statements—and you may assume that that reflects the position of the ICC—isn't it appropriate to relate the $2 million to the profits of the company, rather than to the total revenues and total operating expenses, in measuring the significance in terms of its relation to the rate-making process?

A Okay. If I were to try to explain to my class what would go on in this process, the regulatory process in transportation, which is very similar to what it is in other areas, the regulators attempt to—or are attempting to assure that rates of return—that rates that are—rate increases that are granted are consistent with target rates of return; at least that they don't go above some acceptable rate, and don't fall below some acceptable rate. Okay.

* * * *

[2063] Q Professor, in every situation, when we're looking at the benefits of operating through Iowa passed on to the traffic affected by Iowa, the percentage effect on the revenues, and as related to the revenus and costs, would be substantially higher than projected here, would they not?

A Why is that?

Q That which is related to the cost of going around to the specific traffic which is affected by going around.

A I don't know who makes that kind of a relationship, [2064] and in what sense that relationship is relevant; because, as I understand, the rates are not—the rates the shipper pays are not contingent upon how CF chooses to route its trucks, directly, you know, so there is not a different rate when they run it around than when they run it through Iowa.

Q Have you ever heard of a commodity rate?

A Yes, I have heard of that.

Q Do they make specific commodity rates that involve specific movements for specific shippers, and those rates are based upon the cost of the affected traffic—

A Okay.

Q —to the extent that we have traffic that is affected by higher costs—

A All right.

Q —as a result of operating around Iowa? Isn't the ability of the carrier to provide low commodity rates to that traffic reduced by the higher costs?

A Okay. I think I understand what you are saying; and if I do, then I agree that for particular classes of shipments—in your example, commodities—where the rates can be adjusted to vary with the carrier, then CF could be charging a higher price by more than that .327 percent, yes. If that's what you are asking, I would say yes; but what I said in my testimony, if you recall, was that what this is, is an average rate differential associated with the existence of the ban versus not, [2065] and that for individual classes of commodities and shipment size, and every other characteristic that one looks at in setting rates, you could make some higher and some lower, but on the average, arithmetic tells, you know, that the rate reduction—maximum rate reduction that you could provide the shippers of CF, without reducing the return on equity and without passing through more than 100 percent of the cost savings, would be that .327. You can distribute it all to one commodity carrier, or you could distribute it all to one commodity shipper, or you could distribute it to other shippers.

Q The way you showed, of being insignificant, is by spreading it around over the whole system?

A The way it's insignificant on the average for a particular—you can make it significant for one shipper if you have got the right to set a rate that—and recover from him the full $2 million, and then that is surely significant for that shipper. The rate-making process is one which does spread it around, if I understand it. To a large extent, it spreads it around.

Q That's entirely premised on your understanding?

A Yes, that's correct.

* * * *

[2071] ROBERT R. RIGLER,

called as a witness by the Defendants and Defendant-Intervenor, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BITTNER:

Q Mr. Rigler, would you, for the record, please state and spell your name?
A Robert R. Rigler, R-i-g-l-e-r.

* * * *

[2072] Q Now, you have been named as a party in the lawsuit that we are involved here with today, are you aware of that?
A Yes, sir.
Q In what capacity, sir?
A I am Chairman of the Department of Transportation Commission.

* * * *

[2073] Q Now, in connection with that power that was delegated did the Transportation Commissioners take action with respect thereto?
A Yes. The first year we were faced with the issue—1975, I think it was; January of '75—we considered it and rejected taking any positive action to legalize them by a four to three vote, as I recall.

The next year the issue came before us again, and by a four to three vote we did adopt a rule which would have had the effect of legalizing them on all the highways in the state of Iowa, with the provision that we would later adopt an appropriate fee schedule, and with the provision that the [2074] rule would not be effective unless and until the Legislature sent to the Governor bills which would outlaw the use of studded snow tires in the state, and which would implement what we call functional classification of highways.

* * * *

Q Were those conditions ever satisfied?

A The Legislature didn't, within the time frame, implement functional classification. They did this last year, but they have not outlawed studded snow tires.

* * * *

[2075] Q At the time of your deliberations with respect to the issue of increasing the length of the double bottom 65 feet, did you have before you the study captioned "65-Foot Twin-Trailers on Iowa Highways," which had been prepared by the Department of Transportation and which has been marked as Exhibit 2, Plaintiff's Exhibit 2 in this litigation?

A My recollection is the first year we voted on it, 1975, we did not have that report, but the next year—January of '76, it would have been—we did have that study.

Q Had you received the same in connection with your deliberations?

A Yes, sir. It had been presented to us.

Q Did you rely on the study in connection with your deliberations?

MR. LEDERER: Your Honor, I think we would have to object to this. We are starting to reach the point where Mr. Rigler is being asked to testify as to the intent and the deliberations of the Commission, and I think the general rule is that a legislator is not competent to testify as to the intent of purposes of the legislature, and I believe that same rule is applicable to an administrative body.

THE COURT: He can testify as to whether or not he personally relied on it.

MR. BITTNER: That was the intent of my question, Your Honor.

[2076] THE COURT: All right.

A Well, I certainly was aware of the staff report. I went over it, but I didn't agree with the conclusions that the report came to, the recommendations of the staff. It was the consensus of the majority of our planning staff, and I had the feeling that it was not the unanimous feeling of our planning staff. I was certainly well aware that it was an opinion, certainly a subjective opinion, by our staff that it was based on what seemed to me to be figures which were supplied by the industry affected. Our staff had difficulty, I think, getting what I would consider unbiased information about this controversial question, and in this instance I did not follow the recommendation of the staff, as I have done on several other occasions.

Q Mr. Rigler, as it relates to that study, do you recall that it did cover the area of wear and costs?

A Yes.

Q Did you have any concern about this area of the study?

A Well, certainly we are vitally concerned with costs and wear. It is our job to represent the interests of the average citizen, the general public, and anybody who has been connected with the Highway Commission or the Department of Transportation knows that our roads are wearing out a lot faster than we are able to replace them with the revenues [2077] available, and so naturally we are vitally concerned with wear on the highway, replacement of the highways, and the safety, of course.

Q As it relates to the figures that were used in that study, did you have any concern?

A Well, certainly I had concerns with a good many aspects of the report, and I was certainly aware that in any report of that kind one small error can be multiplied and compounded as you project it on out, and I guess my main concern was that I just didn't have confidence that our staff really had actual information. It wasn't a mathematical decision. It was certainly based on the opinions of our people who prepared it.

* * * *

[2084] Q (By Mr. Goodwin) Mr. Rigler, in this lawsuit the Plaintiffs are asking the Court to modify the existing statute to the effect of allowing 65-foot twin trailers on the interstate system, as well as allowing the Plaintiff access to terminals on and off of the interstate system.

Did the DOT Commission consider the possibility of allowing 65-foot twin trailers only on the interstate system?

A Yes. We considered that. In 1976, when a majority of us voted for a rule to legalize double bottoms, with the conditions I mentioned before, we debated that question. There was consideration of confining it to interstates or four-lane highways and highways of a certain width, but the majority of our Commission voted to make it apply all over the state to give Iowans the benefit—so-called benefits of double-bottom trucks, and so the proposal we finally voted on, after voting on some amendments, would have allowed twin trailers on all highways, including some of our 18-foot primary highways that had the curbs on them.

[2085] Q Why did the Commission decide against only limiting them to the interstate system?

A Well, the argument was made quite effectively by the members of our Commission, who are in favor of legalizing double bottoms, that we should give Iowa firms, Iowa shippers, the so-called benefits of the use of twin trailers; and if we confined it to the interstate or four-lane highways, the vast majority of the communities' industries would have been excluded from any of the benefits.

CROSS EXAMINATION BY MR. VARDA

* * * *

Q Mr. Rigler, you made reference to a staff opinion concerning the 1975 study. Is it my understanding you're testifying you disagreed with their opinion?

A Yes, sir.

Q The consensus of opinion of the staff—the conclusion of the staff was to recommend 65-foot twin trailers on highways in this state?

A Yes. That was the gist of the recommendation of our planning division. We had a new director come in in 1975, a Mr. Preisser, and I realized—had the feeling from the beginning that he was in favor of legalizing heavier trucks and longer trucks. I think our staff was influenced by his opinion on it. [2086] Mr. Preisser changed his opinion the day we first voted on it. He was all ready to recommend that we pass a rule legalizing double bottoms, but over the noon hour, after visiting with the Governor, he changed his mind; but I think our staff was of the opinion that they should recommend double bottoms, and they did. But, as I said, I didn't agree with their conclusion, and I don't think that it was their personal opinion; and, very frankly, I didn't buy their recommendation, because I don't think their recommendation was based on solid facts. It was opinions, and it was a consensus, like most of our staff reports are. I'm sure there are competent members of our staff that disagreed with the recommendation of the majority on that.

Q Did Mr. Kassel make the favorable recommendations for 65-foot twins?

A He was the head of our planning division at that time. I'm not sure that he—I think probably he signed the report. I'm not sure he made the presentation. I assume he did, but some of the younger people on the staff were certainly involved in it.

Q You recognize that the real beneficiaries of allowing 65-foot twins in Iowa would be the coast-to-coast trucking firms, and the shippers who use them to haul their goods?

A Is that a question?

Q I'm asking you if you recognize that fact.

A That the real beneficiaries—Well, certainly the [2087] motor truck association made a great point, the pro double-bottom members of our Commission made a great point that we had to legalize them on every highway in this state to give the benefits to all Iowans. Certainly I was of the opinion then, and I'm still of the opinion that the real impetus for legalizing double bottoms is by the coast-to-coast shippers. They're anxious to get on I-80; but we had a real concern about the entire State of Iowa and any benefits accruing to them, to the citizens of this state, too.

* * * *

Q You have indicated this is an interest to the shippers. Would that be reflected in lower rates and faster freight service?

A Well, theoretically, but I think this is a pretty regulated industry. I'm not sure that—I would guess the main beneficiaries with the regulations we have on rates, would accrue to the stockholders of the trucking company. Theoretically I suppose eventually, if costs are lower, the shippers would share [2088] the benefits.

Q (By Mr. John Varda) Isn't it true that that is a vital economic issue to them, meaning the truckers and the shippers?

A Well, it obviously must be. They pushed hard for it for as long as—since I was first elected to the Legislature, for heavier trucks and longer trucks. Obviously it is to their economic benefit. I am not sure it is to society's, though, because of the safety factors and the wear and tear on the highways.

* * * *

[3034] STEVEN C. WALGRAVE,

called as a witness by the Plaintiff in rebuttal, being first duly sworn by the Clerk, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LEDERER:

Q Will you state your name for the record, please, Mr. Walgrave?

A Steven C. Walgrave.

* * * *

A I work for Freightliner Corporation.

Q In what position or capacity do you work for Freightliner?

A I am a senior research engineer with the R & D Department.

Q Is Freightliner Corporation a subsidiary of Consolidated Freightways?

A Yes, it is.

* * * *

[3035] Q Prior to being employed by Freightliner, what was your employment?

A I worked with the Illinois Institute of Technology Research Institute in Chicago.

Q Could you describe, in summary fashion, what your duties were at the Illinois Institute of Technology Research Institute?

A I participated in various research projects, many of which were government sponsored, dealing with design feasibility studies. I also participated in simulation studies, many of which were directly related to articulated vehicle handling and stability.

Q Are you in fact a co-author of a study addressing the handling characteristics of various vehicle combinations?

A Yes, I am.

Q Is there extensive literature in the field of vehicle handling, stability and maneuverability?

[3036] A Yes, there is quite a bit of literature on that. During my work with IITRI, or the Research Institute, we had at our disposal I would say well over 200 documents relating to different aspects of vehicle stability.

Q Are a number of those documents addressed specifically to 65-foot twin-trailer stability and handling characteristics?

A Yes, several of them.

* * * *

[3037] Q What is the relationship between stability and maneuverability?

A It is a very complex relationship, and in particular for articulated vehicles, increased stability will in general result in a slight decrease in maneuverability, and the opposite is true also.

* * * *

Q In vehicle design, is there normally a compromise between stability and maneuverability?

A Yes, there is indeed.

Q Is it desirable to have a vehicle with as much stability as is possible?

A No, not at all. I think a vehicle with absolute stability would be a vehicle which was almost non-maneuverable.

Q Conversely, would it be desirable to have a vehicle with maximum maneuverability?

[3038] A No, not at all.

Q Were you present in the courtroom last Friday when Mr. Wandling testified?

A Yes, I was.

Q Can you, perhaps, using the blackboard, illustrate the points of why it is undesirable to have ultimate stability or ultimate maneuverability?

* * * *

The objective in a total vehicle design is more to have a compromise between large oscillations and long response time, and basically what is achieved or what is intended is to accomplish a situation where you have a response which will very [3039] quickly respond, which will meet the actual achieved value in a very short time with a minimum amount of overshoot and oscillatory motion, and very quickly decaying to the steady state value.

That's roughly the relationship between a maneuverability and the stability aspects in the vehicle design.

THE COURT: Did you say "steady safe" or "steady state" ?

* * * *

Q In order to obtain rapid response times and maneuverability, are vehicles normally designed so as to have some small amount of overshoot?

A Yes, right. It actually increases your maneuverability. It gives you a faster response time, and yet maintains responses which are well within the limits of a stable vehicle.

* * * *

[3040] Q How is the testing of the effects of these factors and testing and research in the field of vehicle dynamics or vehicle stability and maneuverability normally conducted?

A Well, there are two modes of testing of the stability and maneuverability of vehicles; the first being that of a full-scale test on natural test surfaces, generally instrumenting the vehicle. These are typically very lengthy in time and also very costly.

The second method of achieving this is through computer simulation.

* * * *

[3042] Q (By Mr. Lederer) Why is it normal to use a computer for these mathematical models?

A Well, the complexity of the equation of motion, particularly in multi-unit vehicle consists are extremely difficult to handle by hand. There is a large interrelation between the parameters of the vehicles, as affects the stability handling of the vehicle. Just in a simplified model, a plainer lateral response model of a vehicle, just to give you an idea, I would say the equations of motion alone would occupy about two typewritten pages of paper, and this is before really the analysis, the reduction of those equations to yield a solution.

Q Is it possible to analytically determine the relative stability of two vehicles with different parameters without actually solving the equations of motion?

A I would say no. It's almost impossible. The total complexity of the analysis yields it virtually impossible. If you take, for instance, the weight of the vehicle trailer in the double-bottom configuration, that single parameter, of course, affects the load on the tires of the trailer, it affects the load on the tires of the dolly, the penetration of the fifth wheel on the dolly—or due to the penetration of the fifth wheel on the dolly, the load of the second trailer is going to affect the vertical load on the pintle hook, which in turn affects the vertical load on the first trailer suspension [3043] and the vertical load on the first trailer's fifth wheel, which in turn affects the vertical load on all the tractor tires. The lateral stiffness of those tires are directly affected by the vertical load on them, and so that one parameter affects the parameters—the tire parameters throughout the entire vehicle.

Q And then if you have variables in the parameters, the situation becomes even more, I assume, complex?

A Oh, yes, indeed.

Q When you were at ITTRI—Illinois Institute of Technology Research Institute, as I understand it?

Q —did you yourself develop computer models for various vehicles?

A Yes, I did.

* * * *

[3044] Q Did you and your associates run computer simulations on large articulated vehicles?

A Yes, we did.

Q What would those large articulated vehicles have included?

A We did one study which was directed at looking at the stability aspects of seven or eight different vehicles. They consisted of a tractor with a 45-foot trailer, tractor with a 40-foot trailer which was the base line, tractor with double 40-foot trailers, tractor with double 27-foot trailers, tractor with triple 27-foot trailers, and a straight truck with a full trailer.

* * * *

Q (By Mr. Lederer) Would the tractor with the double 27-foot trailers be the 65-foot twin?

[3045] A Yes.

Q Were those various computer models validated?

A Yes. That program, prior to its use, was validated against actual full-scale experimental results, and that was done for two different cases. It was validated against a tractor with 40-foot trailer, and also against—a full-scale test against a tractor with double 27-foot trailers, the 65-foot overall length.

Q ITTRI actually ran tests of the entire vehicles going through various maneuvers in order to validate their various models?

A Yes.

Q Did those tests include violent maneuvers?

A Those tests were generally considered limit maneuvers. That was at the discretion of the driver. They would perform the maneuver to what was considered the ulimate of their capability, and the actual test that I correlated to the vehicle attained between .4 and .5 G lateral accelerations.

Q That is an extreme maneuver?

A That is rather extreme.

Q Were some of those, the early validation tests and some of the work in developing these computer models, published in a report entitled "Stability and Handling Criteria of Articulated Vehicles Technical Report"?

A Yes, they were.

* * * *

[3046] Q (By Mr. Lederer) And is that report published and available in the literature?

A Yes, it is. That study was done, I believe, for the National Highway Traffic and Safety Administration, which has unlimited distribution.

Q In the work that you did, did you compare various vehicle types under varying conditions, varying maneuvers, and could you describe some of those maneuvers?

A Well, yes. In the study that I was a co-author on the report of, we considered the vehicles I mentioned in several maneuvers. They included lane change maneuvers, which was a full 12-foot lane change accomplished within 160 feet, both with and without braking; there was also a tight corner test, with an 80-foot radius, both with and without braking; and a straight line analysis, both with and without braking.

Q Were the results of your research published in a document entitled "Theoretical Evaluation of the Relative Braking Performance Stability and Hitch Point Forces of Articulated Vehicles"?

A Yes, they were.

* * * *

[3047] Q What were your conclusions in regard to the handling characteristics of these various vehicles that you tested?

A The overall conclusion was that there were no appreciable differences between the stability limits of any of the vehicles considered.

Q Under the various maneuvers, would the stabilities of these vehicles—were there any wide variations among them?

A No. There were no wide variations. In general, through almost all of the maneuvers considered, the stability limits of all the vehicles did not vary more than 10 per cent from the base line 40-foot trailer vehicles.

* * * *

[3048] Q If, in actual highway use, both a twin—meaning a 65-foot twin vehicle—and a 55-foot semi vehicle had differing yaw angles or yaw oscillation angles with a twin slightly higher than the semi, what would be the practical effect of the difference? Excuse me. Let me go back and restate the question.

Let's assume they have the same yaw angle. Would there be a practical difference between the two vehicles?

A Yes, there would be. Given the same yaw angle for each of the vehicles, if the trailer of each vehicle had the same yaw angle, the lateral offset or lateral intrusion of the longer unit is obviously going to have to be larger.

* * * *

[3049] Q And when we say the vehicle with the longer trailer, we're talking about the 55-foot semi?

A Correct.

Q What sort of accidents would result from encroachment, in terms of accident types?

A For a lane intrusion?

Q Yes.

A That's typically characteristic of a sideswipe or a minor side scrape type of incident.

Q Would encroachment be important in terms of passing accidents?

A Yes, it would indeed.

* * * *

[3050] Q Under normal operating conditions, is an empty semi or twin trailer more or less stable than a full loaded twin or semi?

A Well, for the van type vehicles, which I have primarily been concerned with, an unloaded vehicle is more stable than a loaded vehicle.

* * * *

[3051] Q Mr. Walgrave, has Freightliner Corporation recently contracted with the Michigan Highway Safety Research Institute to conduct studies of 65-foot twin trailer van stability?

A Yes, they have.

Q And were those studies conducted for the purpose of this litigation?

A Yes, they were.

Q And can you describe how recently those studies were done?

A Full-scale tests of a 65-foot van double was conducted by HSRI, I believe it was, on June 6.

Q Can you describe what the purpose of those tests were, and the general way in which they were conducted?

A Well, yes. They were a direct comparison to the stability of the Michigan double-bottom unit. The test in itself was a maneuver identical to that performed on the Michigan double-bottom unit, under as identical of conditions as possible.

[3052] Q (By Mr. Lederer) Did Mr. Ervin of the Highway Safety and Research Institute actually conduct and supervise these tests?

A Yes, he supervised the entire operation.

* * * *

Q (By Mr. Lederer) Are there substantial differences between the Michigan double-bottom tanker and the 65-foot twin-trailer vehicle at issue in this case?

A Yes, I think certainly so. The configuration of the vehicles is substantially different.

Q Did the test, which Mr. Ervin conducted and of which we have the filmed results of, show a substantial difference in stability between the two vehicles?

A Yes, I would say they certainly did.

Q Have you brought with you today a film of those studies?

A Yes, I have.

MR. LEDERER: Your Honor, if we may, we would like to show the film.

* * * *

Q (By Mr. Lederer) Mr. Walgrave, perhaps, if you would do so, as the film goes along, you may be able to point out the salient features of it.

* * * *

(Film presentation was made.)

* * * *

[3054] Here we will see the lane change maneuver conducted at 40 miles an hour for the 65-foot van combination. You can see there is no touch-down of the outriggers, very little smoke involved off the tires, and the oscillations died out very quickly. That was a test identical to that used here.

If we can stop here, I would like to point out a few aspects of this double-bottom vehicle, which are very different from the Michigan double tanker unit.

* * * *

[3055] Q Is this the 55-foot Michigan double-bottom tanker that was the subject of the HSI report which we discussed to some degree on Friday?

A Yes, it is.

Q Can you explain the differences between this vehicle and the 65-foot twin trailer that we just saw?

A Well, obviously you have got a considerable weight difference. This vehicle at its test configuration weighed 152,000 pounds, where the 65-foot van double had a total vehicle weight of 75,480 pounds, about two to one. You can also see that the wheelbase on these vehicles is quite different. The effective wheelbase for the lead trailer is measured from the center axle, which is the center of the total suspension. I believe this measured on the order of 175 inches, as opposed to approximately 250 for the van trailer.

On the rear trailer, the same is true. It is measured from the center of the dolly tandems to the center axle of the three on the rear trailer. I believe this measured 125 inches for the second tanker unit, as opposed to again the 250 on the van unit.

The overhang on this vehicle, again measured from the suspension center line to the pintle hooks, was significantly longer than that which you found on the van units. Obviously the number of axles are quite different. [3056] The CG height—there was some variation between the CG height on the two units used here, particularly as compared to those of the van units. The overall length of this vehicle is only 55 feet, as opposed to 65 in the vans.

Q Would these numerous differences that you are referring to all be differences that would have effects on the stability of the two vehicles?

A I would say quite definitely so.

Q The rear wheelbase on that rear trailer, is that less than what the ICC requires to haul explosives in interstate commerce, do you know?

A I really couldn't comment on that.

Q It is less than 184 inches, though?

A Yes, it is. I believe it is listed as 125 inches.

If we can proceed on with this, the test performed on this vehicle— Well, this vehicle was actually tested first. They were maintained as identical as possible. The actual test included a two-second steering input, which was used as their reference test, and it was a very defined severity of the maneuver involved, which was measured by the accelerometer in the tractor. Both tests were conducted at 40 miles an hour.

* * * *

[3057] The test of this vehicle was also done in its empty configuration. You will see there that the van is indeed empty. This test was performed again identical to the others, the same steering input, the same maneuver severity.

MR. LEDERER: I would respectfully call to the Court's attention to the fact that on Friday Mr. Wandling testified that this would be the less stable of the two.

A (Continuing) This test occurs very early in the scene as it comes into the picture here, and right there is performing that maneuver. You see there is a very little roll or response in the empty vehicle.

I might comment that from those tests, the 65-foot van combination vehicle demonstrated only about 42 percent of the rear trailer lateral acceleration or the amplification. That's approximately a 60 percent reduction over that of the [3058] Michigan double-bottom unit.

* * * *

[3059] Q Mr. Walgrave, do you have a professional opinion as to the handling and stability characteristics of 65-foot twin-trailer vehicles and 55-foot semitrailer vehicles that we are talking about, van-type vehicles in both cases, with similar loadings?

A Yes. In general, I would say that from the work I have done, from the sources I have read, that the stability of the two units are very comparable. I would say that the 65-foot twin van unit demonstrates a very slight amount less stability, [3060] but at the same time has sightly more maneuverability than what the 55-foot single unit has.

Q Do you have an opinion as to a 65-foot twin-trailer vehicle and a 60-foot twin-trailer vehicle?

A Yes. I would say that the 65-foot unit would most likely have a very slight stability increase over that of a 60-foot unit, with also a very slight reduction in maneuverability as compared to the 60-foot unit.

Q On what is that opinion based, sir?

A Well, that's based on the work that I have done in the field, the simulations I have run, the actual test data that I have viewed and just the general trend data that I have been aware of, and I have accumulated through my work in the field.

Q Is the difference in the stability of the two units largely the result of the difference in the wheelbase?

A Yes, it is. In fact, in the report that I co-authored, one of the conclusions that we drew was that the length of a trailer for comparable vehicles—a slight increase in the length of a trailer was a stabilizing effect.

Q For comparable vehicles, you mean when you are comparing double-bottoms with double-bottoms?

A I am saying all other factors being the same, that a slight increase in trailer length yields a slight increase in stability.

Q Let me just ask you one further point. Can you explain [3061] what the Illinois Institute of Technology Research Institute is?

A Yes. That's a not-for-profit research institute, which is devoted to conducting research in multiple fields of science, really.

Q Is that associated with the Illinois Institute of Technology?

A It is associated with the Illinois Institute of Technology at the Board of Directors level, but in its operation it is essentially separate and distinct.

CROSS EXAMINATION

BY MR. PAFF:

* * * *

[3062] Q Exploring your relationship with the Illinois Technical Institute—Institute of Technology?

A Illinois Institute of Technology and Research Institute.

Q Is that funded by the trucking organizations?

A No, it is not.

Q Where does it receive its financing?

A Its financing is gained through the contracts on the projects that it undertakes.

Q So if a trucking company would contract with it to do a particular study, in that sense it would receive some financing from that party?

[3063] A That is true.

Q Or if a public agency wanted a particular study, it might receive some money from the public agency, regarding some study?

A That's right.

Q And in the time that you were there, was it more typical a situation that a trucking association or outfit would ask for a contract than a public agency?

A No, not at all. I think while I was there, on the order of 90 per cent of the work I did was under government contract.

* * * *

[3064] Q What were the two vehicles compared?

A Well, there were, as I stated, seven or eight different vehicles which were compared. Two of those included, as base line, was a tractor with tandem axle rear suspension, and a 40-foot trailer with tandem axle suspension. Another one which was included within the total was a five axle, 65-foot overall length, double-bottom van type configuration.

* * * *

[3065] Q Now, were these CF's trucks?

A No, they were not explicitly CF's trucks. We were given the dimensions, the weight parameters required to run the simulation. There was no distinction as to whose or what kind of truck they were.

Q Typically doesn't the trucking industry supply the trucks to them for their use in doing the tests?

A We receive the vehicle specifications through the Western Highway Institute.

* * * *

[3069] Q Following your same reasoning with regard to lateral intrusion, if I were towing a 24-foot trailer attached to a 65-foot—excuse me—27-foot trailer, and my overall combination vehicle length was 60 feet, I would have less lateral intrusion on the lane, assuming I had the same yaw angle?

A Yes, that's true. That's one of the factors involved in it. Of course, just based on the wheelbase and all the trends involved, I would say that that consist may also be slightly less stable and result in larger yaw angles.

Q I understand that portion, sir, but using your logic with just regard to the situation of the yaw angle and its comparison to the lane intrusion, that would be a factor that would be less with regard to a 60-foot double than it would be with regard to a 65-foot double?

A For given yaw angles, that's true.

* * * *

[3070] Q (By Mr. Paff) Isn't that what we are really talking about, sir, is you might sacrifice a little stability for a little maneuverability, or you might sacrifice a little maneuverability for a little stability? We are making trade-offs when you design a vehicle, is that a fair statement?

A Yes, that's the entire process in designing the vehicle, is to make the trade-off so that you have the best of both.

* * * *

[3073] Q And would the load effect, when considering loading two trailers as opposed to loading one trailer—would that compound that particular load effect in your equations, and so forth?

A Well, I'm not quite sure what you mean by "compound that effect." In my estimation, you're trying to achieve a desired load distribution, whether it's within a [3074] single trailer or within double trailers.

Q If I concern myself with one trailer, as opposed to two trailers, I mean that additional factor creates more —that compounds the design?

A Okay. I see what you mean. In twin trailers, you have got actually two considerations; first, how much front trailer, how much rear trailer, plus the consideration of where to put the load within each given trailer, sure.

Q So companies have developed loading charts, and so forth, to tell them how much they should have on each axle, and where that load should be?

A That may be true.

* * * *

[3076] Q Were these models and the full-scale tests you talk about conducted by the Western Highway Institute?

A No, they were not.

Q Which institute were they conducted by?

A They were conducted by IITRI by Don Eschelman, who was the project leader in that case.

[3077] Q Were these under contract to a trucking firm?

A They were under contract to the National Highway Traffic Safety Administration.

Q Were any of those vehicles supplied to the institute by the trucking concerns?

A No, they weren't. To my knowledge, they were all rental units.

Q Now, have you actually solved the equations of motion dealing with the 65-foot double bottom and the 55-foot tractor trailer semi?

A How do you mean "solved"?

Q Have you worked them through and come to an analytical—

A By hand?

Q Yes.

A No, not at all.

Q Have you done it with a computer?

A Yes, I have.

* * * *

[3084] Q Would you agree with Mr. Wandling that the principles governing articulated vehicles, whether we are talking about a van-type double or whether we are talking about a Michigan double, are the same?

A That the principles involved are the same?

Q Yes, sir.

A Yes, I would agree with that. The equations of motion for a van-type doubles unit are similar to the equations of motion for a Michigan doubles unit. It is just the parameters that define the true comparison of the two.

* * * *

[3088] Q Now, with regard to the comments dealing with 65-foot versus 55-foot, I believe you said that the twin van has a slightly less amount of stability, is that correct?

A That was our general conclusion through the study we did, yes.

* * * *

[3089] A Would we have an increase in stability with decreased maneuverability?

Q Yes, sir.

A Yes.

* * * *

[3092] Q (By Mr. Lederer) I may have been confused myself among the titles, but referring your attention to the report entitled "Stability and Handling Criteria of Articulated Vehicles," with a number DOT HS-800 915, does that report include comparisons both in computer simulation and actual tests of both 65-foot twins and 55-foot semis?

A. Yes. * * *

* * * *

[3093] Q (Br. Mr. Paff) Would you read for us the introduction of that particular document?

A The first paragraph?

Q Yes, sir.

A "The advent of large complex road trains on public highways, such as the tractor triple semi shown in Figure 1, has necessitated the prediction of the dynamic behavior of [3094] such vehicles during commonly encountered road maneuvers"—

THE COURT: Just a little slower.

THE WITNESS: —"and subject to environmental influences. Vehicle stability and handling criteria based on an experimentally verified mathematical model provide the framework for pre-test safety reviews of existing and new vehicle designs."

* * * *

OPINION OF THE DISTRICT COURT AND ORDER

Filed August 16, 1979

* * * *

HEARING ON DEFENDANTS' MOTION FOR A STAY PENDING APPEAL

Filed August 20, 1980

* * * *

[13] THE COURT: I don't follow your safety argument at all [Mr. Paff] when the record is clear, number one, that diversion causes vehicles to go more miles. More miles is a function of accidents.

The record is also clear that interstates are safer than two-lane highways. It makes it very clear that diversions result in more accidents, more fatalities, more consumption of fuel.

Now, I'm not in a position to tell all of the truckers [14] that they must operate 55 foot semis. The safety argument, I just can't accept it, when you look at the overall safety. There are going to be more deaths, and there is going to be more fuel consumption.

* * * *

DISTRICT COURT'S ORDER DENYING STAY PENDING APPEAL

Filed August 20, 1980

[Caption Omitted in Printing]

* * * *

ORDER DENYING STAY

Filed August 20, 1980

[Caption Omitted in Printing]

This matter came on before the Court on this date for oral hearing on defendants' Motion to Suspend Injunction Pending Appeal, which was filed on August 17, and resisted on August 20, 1979. The Court being fully advised in the premises, finds that the defendants' application for a stay should be denied because:

(1) that defendants have not made a strong showing that they are likely to succeed on appeal, and

(2) that under the circumstances the granting of the stay would result in more accidents, more injuries, more fatalities and more fuel consumption, than would occur if the 65 foot twins were operated through Iowa over I-80 and I-35.

However, the Court recognizes that the defendants may seek a stay from the United States Circuit Court of Appeals for the Eighth Circuit and that they should have time to make such application.

IT IS THEREFORE ORDERED that the Order of August 16, 1979 be, and hereby is, stayed for a period of ten (10) days, commencing upon August 21, 1979 at 6:00 a.m., for the sole and express purpose of affording defendants herein time in which to seek a stay from the United States Court of Appeals for the Eighth Circuit.

Signed this 20 day of August, 1979.

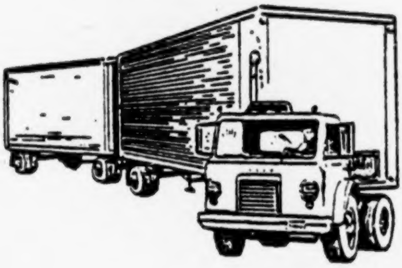
/s/ W. C. Stuart
W. C. STUART
Chief Judge
Southern District of Iowa

EXHIBIT 2

Sixty-Five Foot Twin-Trailers on Iowa Highways

PERSPECTIVE

April 1975



PREPARED BY

THE IOWA DEPARTMENT OF TRANSPORTATION

DIVISION OF PLANNING

CLAIM:

THERE WILL BE A "LARGE" INCREASE IN THE NUMBER OF TRUCKS ON THE HIGHWAYS.

FACT:

There will be an increase of 75,000 trucks annually. The 206 truck increase per day will occur primarily between 6 PM and 6 AM. Another way to look at the change in traffic is to state that during the daylight travel hours each 10 miles (in one direction) of I-80 will have 1 more truck on it. This net increase will be evident on the *interstate system only.* Investigations indicated that the number of 65 foot twin trailer units using Iowa's Interstate System on an average day would total 370. Percentage increases and the origin of these 370 twin trailer units related to the interstate routes are shown in the following table:

ADDITIONAL DAILY INTERSTATE TRUCK TRAFFIC
(FISCAL YEAR 1976)

Interstate Route	Diversions from Other States	New Equipment Serving Iowa	Gross Additional 65' Twin Trailer Trucks	Decrease Thru Replacement	Net Increase in Trucks	% Increase in Total Truck Traffic	% Increase in Total of All Traffic
I-29	29	20	49	- 24	25	1.84%	0.36%
I-35	17	43	60	- 54	6	0.46%	0.10%
I-80	177	68	245	- 82	163	4.81%	1.41%
I-380	13	3	16	- 4	12	0.61%	0.18%
Totals	236	134	370	-164	206	2.70% WTD Average	0.74% WTD Average

BASIS:

A determination of the potential number of 65 foot twin trailer trucks using the state's highways in the first year following enabling legislation was determined through an extensive survey of 77 trucking firms and responses from 160 manufacturers, retailers, and wholesalers in the state regarding their potential use of this type of vehicle. As a check on the validity of the information collected from these sources, 22 other states which presently allow 65 foot twin trailers responded relative to the number of these vehicles in their traffic streams. The 65 foot twin trailers which would eventually operate on systems other than the interstate would be replacements of existing 60 foot twin trailers and 40 and 45 foot single trailers. It was estimated that this replacement process would take approximately 5 years. * * *

* * * *

Issue I

There will be a large increase in the number of trucks on the highways.

Conclusions

1. There will not be a large increase in the number of trucks on the highways as long as legal weight limits are not increased.
2. Assuming no restrictions on 65′ twin-trailer movements, virtually all additional trucks will still travel only the interstate routes.

Basis

There is only a fixed amount of goods available to be shipped by truck. The goods available for shipping are not going to immediately double, triple, or quadruple, merely because a 65′ twin trailer truck is available to haul them.

Further, it has been determined that the legalization of 65′ twin trailers without legal load limit increases will cause very little diversion of shipment from other modes to truck.

Therefore, in view of the above, practically all of the additional trucks expected in Iowa in the near future will arise from diversions of traffic now by passing the state, operational changes by trucking firms, and normal growth in the economy.

* * * *

Net Effect on Interstate Traffic

Since 65′ twin trailer trucks have the capability of carrying more commodities per trip than the conventional tractor semitrailer units, an effective net reduction of trips is realized through the replacement of 40 and 45 foot single trailers and 60′ twin trailers, with 65′ twin trailers:

three 65′ twin trailers = four 40′ trailers = 1 less 40′ trailer trip

five 65′ twin trailers = six 45′ single trailers = 1 less 45′ trailer trip

eight 65′ twin trailers = nine 60′ twin trailers = 1 less 60′ twin trailer trip

By applying these factors to the estimated trips of each type explained earlier, the net effect on truck traffic is determined. * * *

* * * *

From the trucking industry questionnaires it was determined that most of the 65′ twin trailer movements on the interstate system would occur at night, resulting in approximately only 24% occurring during the hours of 6 AM to 6 PM.

* * * *

CLAIM:

THE LONGER TRUCKS WILL CREATE ADDITIONAL SAFETY HAZARDS ON THE HIGHWAYS

FACT:

It could be expected that the 75,000 *additional* truck combination units using Iowa's interstate system and traveling 20 million vehicle miles per year would result in an additional 296 accident involvements and 2 fatality involvements per year. Passenger cars driving this same 20 million vehicle miles would be expected to produce 458 additional accident involvements and 1 fatality involvement annually. In short, while traveling the same distance as an automobile, truck combinations are involved in about ½ the number of accidents but twice the number of fatalities. It is also important to note that if 65 foot twin trailer trucks are required to continue to travel longer distance routes to bypass Iowa, they will travel an extra 6.5 million miles annually which could produce 96 accident involvements and 0.6 fatality involvements per year.

Sixty-five foot twin trailer combinations have *not* been shown by experiences in other states to be less safe than 60 foot twin trailer combinations *or* conventional tractor-semitrailers.

BASIS:

The statement on relative accident and fatality rates for 65 foot twin trailer combinations compared to 60 foot twin trailer combinations and tractor-semitrailers is based on responses and data obtained from several sources. Twelve of the 28 states permitting 65 foot double bottom trucks reported *no* noticeable increase in accident occurrence after the legalization of the longer length trucks. Remaining states responding indicated that isolated statistics by truck type were not kept since the accident rate for trucks did not indicate a growing problem. Accident statistics obtained directly from trucking firms' records (subject to ICC audit) show significantly better accident rates for 65 foot twin trailers compared to tractor-semitrailers and for 60 foot twin trailers compared to 65 foot twin trailers but no significantly different fatality rates among these classes. In reviewing accident statistics, no figures showed a significant difference in accident experience that would indicate an expected higher accident or fatality rate with 65 foot twin trailers. The analysis of maneuverability, splash and spray and aerodynamic disturbance characteristics indicated no sacrifice to safety. An in-depth analysis of Missouri's accident records likewise failed to show any significant difference in accident experience among these truck types.

Characteristics of the 65 Foot Twin Trailer Truck

Maneuverability—65 foot twin trailer trucks require 1.3 to 2.1 feet narrower turning track than a 55 foot tractor semitrailer truck.

Stopping Distance—The Virginia Twin Trailer Study reported that there is relatively little difference beween the conventional and twin trailers tested in required stopping distance. The greatest difference occurred at 55 mph half loaded where the conventional trailer has a greater stopping distance.

Controlability Under Stop—The Virginia Twin Trailer Study reported these trailers trailed as good as the conventional semitrailer in a panic stop.

National 55 MPH Speed Limits—The 55 MPH speed limit has caused all vehicles to travel at nearer the same speed which is a major factor in reducing accident occurrence. Truck/auto speed differentials in Iowa have decreased from 7 mph to ½ mph.

Non-Skid Axles—These would be common to any new truck manufactured after January 1, 1975 and is therefore not pertinent except if the legalization of 65 foot twin trailer trucks stimulate purchases of new trucks.

Enforcement Efforts and Results—The 28 states contacted did not indicate any specific enforcement problems with 65 foot twin trailer trucks.

Driver Opinion—Can and does vary widely on driveability of twin units and safety.

Issue 4:

The longer trucks will create additional safety hazards on the highways.

Fact:

1. Any additional vehicle on the highway system will result in an additional increment of safety hazard.
2. 65 foot twin trailer combinations have not been shown to be less safe than 60 foot twin trailer combinations or conventional tractor-semitrailers.

* * * *

Accidents of Large Motor Carriers of Property published by the Bureau of Motor Carrier Safety, U.S. Department of Transportation Federal Highway Administration, May 1974.

Table 4-3 shows selected accident statistics of large interstate motor carriers of property. These statistics are compiled from accident reports which all for-hire motor carriers involved in interstate commerce are required to file with the Bureau of Motor Carrier Safety.

It should be noted that these figures are based on a very sizable number of vehicle miles therefore making them quite reliable.

* * * *

Accident Records from Trucking Firms. Table 4-6 is a collection of accident statistics obtained from interstate trucking firms operating twin-trailer trucks and tractor-semitrailers for the years 1969-1974. The data for years 1969 through 1973 were obtained from the Bureau of Motor Carrier Safety and data for 1974 was obtained directly from trucking firms. The overall accident figures presented here cannot be compared to figures presented earlier since only accidents resulting in property damage greater than $2,000 are included. However, the fatality rates and the accident comparison between doubles and tractor-semitrailers from this table should be quite reliable in that they are based on several years and extensive vehicle miles of travel. This table shows doubles possessing lower accident and fatality rates than tractor-semitrailer combinations for all years compared.

Table 4-7 shows accident statistics collected by the Iowa DOT from the trucking firms for the year 1974. These figures also appear as 1974 data in Table 4-6. The most noticeable feature in this table is the 0.0 fatality rate possessed by 60′ double bottoms. This figure is primarily due to the low amount of travel accumulated for these trucks, and will undoubtedly go up as more miles are traveled.

These figures will be analyzed in greater detail later in this report to help establish what inferences can and cannot validly be made from the occurrence rates found in this table.

State Accident Records

Great efforts were made to utilize the experience of our 28 fellow states where 65' twin trailer trucks are currently operating. It is felt that these transportation officials can best present an unbiased evaluation of the relative safety of the various classes of vehicles based on their accident records and experience with these vehicles.

The 28 states allowing 65' twin trailer trucks are:

Arizona
Arkansas
California
Colorado
Delaware
Idaho
Illinois
Indiana
Kansas
Kentucky
Louisiana
Maryland
Michigan
Minnesota
Missouri
Montana
Nebraska
Nevada
New Mexico
North Dakota
Ohio
Oklahoma
Oregon
South Dakota
Texas
Utah
Washington
Wyoming

The results of these queries are summarized below:

1. Twelve of the states replied that there was no noticable increase in accidents when 65' double bottoms were legalized. The remaining 16 states either did not answer in this area or stated they didn't know.

2. Eleven states responded that a breakdown of accidents between 65' twin trailers, 60' twin trailers and tractor-semitrailers was not available. California referred to the report compiled by their highway patrol and cited separately. Kansas presented an accident rate of 2.74 accidents per million vehicle miles and a fatality rate of 6.37 per 100 million vehicle miles for their doubles. Utah responded that there were "very few" accidents and the remaining states did not respond in this area.

3. Seventeen of the states reported they had experienced no difficulties unique to certain pavement widths or geometric features because of 65' double bottoms. The remaining states did not respond to this question.

4. All nineteen states responding to the question of splash and spray stated there was no problem.
5. Seventeen of the 19 states responding to the area of whip effect stated there was no problem, Oklahoma stated there was a problem if the first trailer is loaded and the second empty, South Dakota just responded "yes" a problem existed.
6. Eighteen of the 19 states responding to the question of any noticable handling problems stated no problem while one stated unknown.
7. Eleven of the 17 states responding to the question of public reaction indicated the public was indifferent towards double bottom trucks from the beginning, 5 states indicated no hostility or no comments from the public, and one state indicated hostility at first but indifference later.

* * * *

Missouri Accident Study

The following information was obtained from the records of the Missouri Department of Public Service pertaining to accident experience of double bottom trucks over the period 1971-1974 in Missouri.

On the interstate system, 60' double bottom trucks had 5 recorded accidents (rural and municipal) while traveling a total of 12,784,100 rural miles for an estimated accident rate of 33.24 accidents per 100 million vehicle miles of travel. One of these accidents resulted in a fatality for a fatality rate of 6.65 fatalities per 100 million vehicle miles of travel.

Comparable figures for 65' double bottom trucks on the interstate system are 51 accidents (rural and municipal) while traveling a total of 154,571,800 rural miles for an estimated accident rate of 28.05 accidents per 100 million vehicle miles of travel.

Two of these accidents resulted in fatalities for a fatality rate of 1.10 fatalities per 100 million vehicle miles of travel.

Braking Performance

Probably the most important safety factor in any highway vehicle is braking.

* * * *

Stopping distance comparison tests between double bottoms and semitrailer combinations were conducted in connection with the Virginia Twin Trailer Study and the results were as follows:

1. There is relatively little difference between the conventional and twin trailers tested with regard to stopping ability.

2. The greatest difference between the two units is found for the 55 MPH half loaded tests, where the conventional trailer has a greater stopping distance than does the twin trailer.

* * * *

Passing Distance

The difference in the time required to pass a 65-foot twin trailer combination compared to a 60-foot twin trailer, depends on the difference in speed of the two vehicles.

Using the same assumptions that the American Association of State Highway and Transportation Officials (AASHTO) used in their publication "A Policy on Geometric Design of Rural Highways 1965" in figuring minimum passing sight distance, the additional distance required for a passenger car to pass a 65 foot truck compared to a 55 foot truck traveling at 50 mph would be:

Average passing car speed during the occupancy of the left lane	60 MPH
Truck Speed	50 MPH
	10 MPH or 14.7 ft/sec

Difference in truck length 65-55 = 10 feet

$\frac{10 \text{ Ft.}}{14.7}$ —0.68 sec. time to pass additional 10 ft.

0.68 (60) 1.47 = 60 ft. = additional passing distance

If an oncoming vehicle in the opposing traffic lane is present and is also traveling at 60 mph, the additional passing distance required is 60 ft. + 60 ft. = 120 ft.

The additional passing distance required when comparing the 65 ft. twin trailer truck to a 60 ft. twin trailer truck under the same conditions would be 60 ft. AASHTO allows between 9.3 and 11.3 seconds for occupancy in the left lane by the passing vehicle depending upon the speed of the passinge vehicle, in their calculation of minimum safe passing sight distance.

* * * *

The data shows that a slight increase in length has no significant impact on the passing distance. An increase in length of 5 ft. (65 to 70 ft.) would increase the passing distance from 1942 to 1977 ft. or 35 ft. at constant speed differential. At accelerated speed differential the difference is 1377 and 1397 or 20 ft.

Maneuverability

The standard measure of maneuverability is "off-tracking" i.e. the amount by which the rear wheels of a vehicle fail to follow the path of the front wheels around a turn. The following figure shows the maximum off-tracking of 65' twin trailer trucks compared to a 55' tractor semitrailer truck for various degrees of curvature.

* * * *

This figure indicates that throughout the range of curve radius considered, the 65 foot twin trailer combination consistantly showed a favorable maximum off-tracking compared to the 55 foot tractor semitrailer which comprises the vast majority of combination trucks currently operating on Iowa's highways.

Splash and Spray

* * * *

Following full scale field tests using various trucks and truck combinations at Ft. Stockton, Texas in July, 1972, the Subcommittee reached the following conclusions:

1. Vehicle design is an important factor in splash and spray effect. Vehicle shape and location of fuel tanks, stirrups, and other accessories particularly affect the intensity of side spray.

2. Vehicle splash and spray is speed related with its intensity increasing at a rate of approximately 2.8 times faster than the rate or speed increase. It does not, however, become a significant deterrent to the ease and safety of following or passing drivers until speeds around 50 mph are obtained.

3. Of eleven typical truck and truck combination configurations, the truck tractor-tank body semitrailer was rated as having the most severe splash and spray characteristics. In second and third positions respectively in the most severe category were the auto-transporter and the truck tractor-40-foot van semitrailer combination.

The typical 65-foot doubles combination was rated as creating the least splash and spray.

From the material available there appears to be no evidence that the typical 65 foot double-bottom creates an additional hazard with regard to splash and spray anymore so than other truck combinations.

Aerodynamic Disturbance.

No "double" or "triple" trailer truck combinations were tested, but the report indicated preliminary investigations were accomplished by extrapolating the existing data to double bottom truck configurations with two 27-foot trailers instead of one 40 foot semitrailer. Assuming the same cab over engine tractor was used and the overall length was then increased from 55 to 65 foot. The analysis suggested no difference for the bow wave effect. The crosswind effects were about the same also because the flow between trailers appears to offset the effect of increased vehicle length. More openings in vehicles under and between the units appears to reduce the level of crosswind disturbance in the downwind direction.

* * * *

STATE TROOPER OBSERVANCE OF PASSING MANEUVERS FROM THE CAB OF TWIN TRAILER VEHICLES THAT PASSED AND WERE PASSED BY TWIN TRAILER

Findings: The passing maneuver was normal ninety-five percent of the time on the two-lane highways and all the time on the four-lane highways.

* * * *

Accident statistics tables presented earlier coupled with statistical analysis of the range of rates they represent do not show that 65' twin trailer combinations are more hazardous than the 60' twin trailers nor the conventional tractor-semitrailers currently legal in Iowa.

The analysis of braking performance, passing distance, maneuverability, splash and spray characteristics, and aerodynamic disturbance characteristics yielded no areas of required sacrifice to safety with double bottoms compared to conventional tractor-semitrailers.

Statements from insurance companies, California Highway Patrol, and the Virginia study further confirmed the lack of difference between double bottoms and conventional tractor-semitrailers in the safety area.

The final but very important influencing factor is that the data and also the lack of data from the 28 states where 65' double bottoms are currently legal did not indicate any significant difference in accident rates for these trucks compared to conventional tractor-semitrailers.

* * * *

From statement of James B. Spice, Vice President, Loss Prevention, *Carriers Insurance Company*, Des Moines, Iowa:

> "As a loss prevention specialist, I wish to comment on the relative safety of twin-trailer truck combinations. Our company's statistics show that the safety record of twin trailers is even better than that of conventional equipment."

From statement of John Sullivan, Regional Commercial Manager, *Truck Underwriters Association and Truck Insurance Exchange*, Kansas City, Kansas:

> "Our company is a large independent filer of rates and rating formulas. In these independent filed rates we rely in our filing most strongly on our own experience. We make no distinction whatever in rating our power vehicles for liability as to tractors with one or with two trailers. We make no distinction under our ratings for tractor-trailer units for width, weight, or length.
>
> The experience in the State of Kansas illustrates the safe operation of these twin trailers.

> Kansas, prior to its approving statewide use of twin trailers, allowed carriers to operate them on designated highways. My own association with the Kansas Council of Safety Supervisors allows me to testify as to this tabulation of my own knowledge. We had 37½ million miles logged by twin trailers in Kansas during that period. Some accidents were reported in this tremendous number of miles. In not one single case, however, was length or the fact that a twin trailer combination was in use found to be a contributing factor to any of the accidents."

From the statement of R. G. Begeman, Vice President, Engineering Services, *Transport Insurance Company*, Dallas, Texas:

> "During the last five and one-half years we have carefully watched the operation of twin trailers. At no time during this period have we seen the slightest indication that the operation of twin trailers created any additional safety hazards as compared to the operation than they have with their conventional 40 foot trailer combinations. The fleets that we insure have consistently reflected lower accident frequencies with their twin trailer operation than they have with their conventional equipment.
>
> Concern for safety on our highways is most certainly not a valid reason for prohibiting the use of twin trailers. The superior safety performance they have shown in every state in which they operate very graphically illustrates this."

In a letter dated March 8, 1967 to State Senator Howard Reppert, Mike McCrary, Vice President and *General Manager of Carriers Insurance Company*, Des Moines, stated:

> "From a purely statistical point of view the use of doubles has no effect whatever upon liability insur-

> ance rates—in fact they ultimately will reflect a reduction in rates since operators can have the advantage of operating shorter equipment in congested areas.
>
> . . . . the operation of doubles does not constitute any greater hazard on the highway than the operation of any other motor vehicle, whether private passenger, or commercial."

Mr. Robert W. Stevenson, President, *Transport Indemnity Company*, Los Angeles, California, stated in a letter dated August 8, 1966 to Mr. Allen C. Flott, Director, Department of Research and Transport Economics, American Trucking Association, Inc., Washington, D.C.:

> "Our Safety Department unequivocally feels that doubles are safe and efficient and that they pose no additional safety hazard to the motoring public. During the period that doubles have been introduced in the west, the overall safety record of fleets insured by transport has been amply demonstrated by the fact that their insurance rates have been consistently lowered. The bulk of our accounts are basically on a cost-plus insurance program and this reduction in rate is a direct reflection of improved safety in operation."

* * * *

CLAIM:

THERE WILL BE "GREATLY" INCREASED DAMAGE TO THE HIGHWAYS.

FACT:

Increased pavement wear *will* occur caused by the increased number of trucks using the state's road and street systems. The dollar amount of this increased wear is estimated at $11 million during the 20 year period 1975 through 1994. However, direct net revenues from fuel tax, licensing, etc. amount to $15.6 million during the same 20 year period. The most recent studies indicate that trucks and autos cover 87% of their share of the full cost of Iowa's total road system, based on 1974 costs.

BASIS:

The average loadings of 65 foot twin trailers found in other states indicate that these vehicles do *not* carry significantly larger gross weights than the tractor semi-trailers presently in use in the state of Iowa. It therefore becomes evident that only the increase in the numbers of diverted trucks causes the added wear, not the axle configurations or expected gross weights. * * *

* * * *

Issue—III There will be greatly increased damage to the highways.

Conclusion The only increased damage from 65' twin trailer trucks and consequent increased cost can arise only from the wear caused by the increased number of trucks on the highways.

Basis for Conclusion

A widespread misconception is that the legalization of 65' twin trailer trucks will create tremendous additional wear and tear on the highways. However, vehicle weight classification studies for Iowa and surrounding states, responses from questionnaires to other states, and responses from questionnaires to trucking firms, show there is no evidence to support such a conclusion, so long and legal individual axle weights and gross maximum weights are not raised.

* * * *

The design mechanics involve determining an equivalency factor for each vehicle configuration and gross weight so that each pass of a given vehicle can be said to apply a load to the pavement equal to a given number of axle loads. The common denominator used is an 18,000 pound single-axle load which is commonly referred to as an 18-kip equivalency factor.

* * * *

The most prevalent combination of tractor semi-trailer units in Iowa are the five axle configuration shown in Figure III-1. This combination currently averages a gross weight of approximately 63,000 lb.

* * * *

As can be noted from the two figures, the average loaded gross weight of the five-axle semitrailer unit was found to be 63,000 pounds and that of the five-axle twin trailer unit was 65,000 pounds. Comparing the 18-kip equivalency factors for a 63,000 lb. semitrailer vs. a 65,000 lb. twin trailer it is apparent that the twin trailer has a 7% less wear 18-kip equivalency than the semitrailer even though the twin trailer is expected to gross 2,000 pounds more. At an equal loading of 65,000 pounds, the twin trailer causes 24% less wear. At an equal loading of 63,000 pounds, the twin trailer causes 22% less wear.

The 65,000 lb. gross load assumed for the twin trailer units was obtained from average gross values reported in the truck firms questionnaire responses. It is expected that this is a reasonable figure since five states responding to the questionnaire, which have the same maximum gross weight limits as Iowa, reported five-axle twin trailer loads of a lesser magnitude (range from 59,000 to 63,200). The higher 65,000 lb. figure was used so as not to underestimate any wear that could occur.

* * * *

CLAIM:

ALLOWING 65 FT. DOUBLE BOTTOMS WILL SAVE ENERGY.

FACT:

There will be a net savings of fuel nationally of about 7 million gallons per year, or 150 million gallons for the 20 year period with the legalization of the 65 foot twin trailers in Iowa. To save 245 million gallons nationally will require the utilization of 95 million gallons of additional fuel in Iowa. This would cause an average annual increase of 3/10 of 1 percent in the highway fuel consumed in Iowa during the next 20 years. This does not answer the question of larger fuel savings by shifting to a more efficient energy mode than is presently used. Present Commerce Regulations and laws do not provide a tool to force this shift immediately. The economic considerations outweigh the fuel savings at this particular point in time. The State and federal governments will have to provide a different economic climate to transportation users to provide for modal shifts to conserve additional energy in the future years.

BASIS:

The 150 million gallon national fuel savings would result from the shorter haul required by trucks passing through Iowa in place of the bypass routes in adjacent states which are necessary at the present time. Other contributing factors to the fuel savings would be the need for a lesser number of trucks to haul the same volume of goods and efficiencies to be gained by spotting one trailer at its destination and continuing on to a second delivery point with the remaining trailer.

The average annual increase in fuel usage in Iowa over the 20-year study period is approximately 3 percent of Iowa's 1973 diesel fuel usage for transportation. The Energy Policy Council staff indicated that there would be no problem in obtaining this additional fuel. In the event of another fuel crisis, it was felt that the retail distributors along the interstate routes would have no problem with adjusting their allocations to reflect the increased usage because of change in regulation.

* * * *

CLAIM:

IOWA CONSUMERS WILL RECEIVE "INCREASED" ECONOMIC BENEFITS FROM ALLOWING DOUBLE BOTTOMS.

FACT:

A total estimated minimum savings of $145 million will be realized over the 20 year period 1975 through 1994 if 100% of all shipper-carrier cost savings resulting from the use of 65 foot twin trailers (with origins and destinations in Iowa) were passed on to the Iowa consumer. It would result in an average annual savings of approximately $10 per Iowa family. This is *not* expected to occur. What *is* likely is that reduced transportation costs to the truck operator will be absorbed, in part, by the costs of new, larger replacement equipment, and federal and state Commerce Commissions will have a stronger basis for deferring rate increase requests.

* * * *

* * * The carrier questionnaires and subsequent call-backs revealed a reluctance of firms to invest in the 60 ft. twin trailer equipment, (two 24 ft. trailers) because they are *not* considered a standard size trailer, and they could not be competitive in states where the 65 ft. twin trailers are legal. * * *

* * * *

CLAIM:

THE "MAJORITY" OF BENEFITS WOULD ACCRUE TO OUT OF STATE FIRMS AT THE EXPENSE OF IOWA CITIZENS.

FACT:

Approximately 60% of the benefits to be realized from the legalization of 65 foot twin trailers [on all roads] would accrue to out of state firms and state governments. The benefits to be realized in Iowa are, however, still substantial; $145 million over the next 20 years.

* * * *

Summary

* * * This table illustrates the net benefits accruing to Iowa and the net benefits accruing to other states divided into the interstate system and rest of the primary system. In reviewing this table it is shown that if only direct benefits are used that the majority of benefits would accrue to other states.

* * * *

CLAIM:

WE SHOULD NOT ALLOW MORE TRUCKS ON THE HIGHWAYS, BUT INSTEAD SHOULD SHIFT COMMODITY HAULING TO THE RAILROADS.

FACT:

The shifting of freight from trucks to railroads does not appear at this time to have any large scale application as it relates to 60 or 65 foot twin trailer combinations. The major use of 65 foot twin trailers is for the purpose of transporting consumer goods, such as tires, lawn mowers, and dishwashers. This type of commodity usually consumes a large amount of space but is relatively lightweight, valuable and time oriented, therefore, is not conducive to railroad shipment.

* * * *

* * * there is very little overlap in commodities that can realistically be transported by both rail and 65′ twin trailer trucks, since each of these specialized in a different area. The railroad functions best as the transporter of heavy bulk commodities while the 65′ twin trailer truck specializes in light weight freight where rapid delivery is of prime importance.

EXHIBIT 3

* * * *

Recommended Policy On Maximum Dimensions and Weights Of Motor Vehicles To Be Operated Over The Highways Of The United States

Prepared by The Subcommittee on Highway Transport
The American Association of State Highway
and Transportation Officials

Officially Adopted by the American Association
of State Highway and Transportation Officials
December 7, 1964
Revised January 15, 1968
and February 23, 1973
and February 18, 1974

2.06 Length

2.06.01 No single truck or truck-tractor, including any load thereon, shall have an overall length, inclusive of front and rear bumpers, in excess of 40 feet.

2.06.02 No single two-axle or three-axle bus, including any load thereon, shall have an overall length, inclusive of front and rear bumpers, in excess of 40 feet.

2.06.03 No single semitrailer or trailer, including any load thereon, shall have an overall length, inclusive of rear bumper, in excess of 40 feet.

2.06.04 No combination of truck-tractor and semitrailer, including any load thereon, shall have an overall length, inclusive of front and rear bumpers, in excess of 55 feet.

2.06.05 No other combination of vehicles shall consist of more than two units, except that one truck-tractor semitrailer may haul one complete trailer, and no such combination of vehicles, including any load thereon, shall have an overall length, inclusive of front and rear bumpers, in excess of 65 feet.

* * * *

EXHIBIT 4

	Miles (Millions)	Accidents	Fatalities
1975—Without Ban Of 65 ft. twins of Iowa	20.0	296	2.0
1975—With Ban Of 65 ft. twins in Iowa	26.5	392	2.6
Percentage With Ban vs. Without Ban of 65 ft. twins in Iowa	132.5%	132.4%	130.0%

SUBSTITUTE EXHIBIT 6,

BY STIPULATION OF COUNSEL

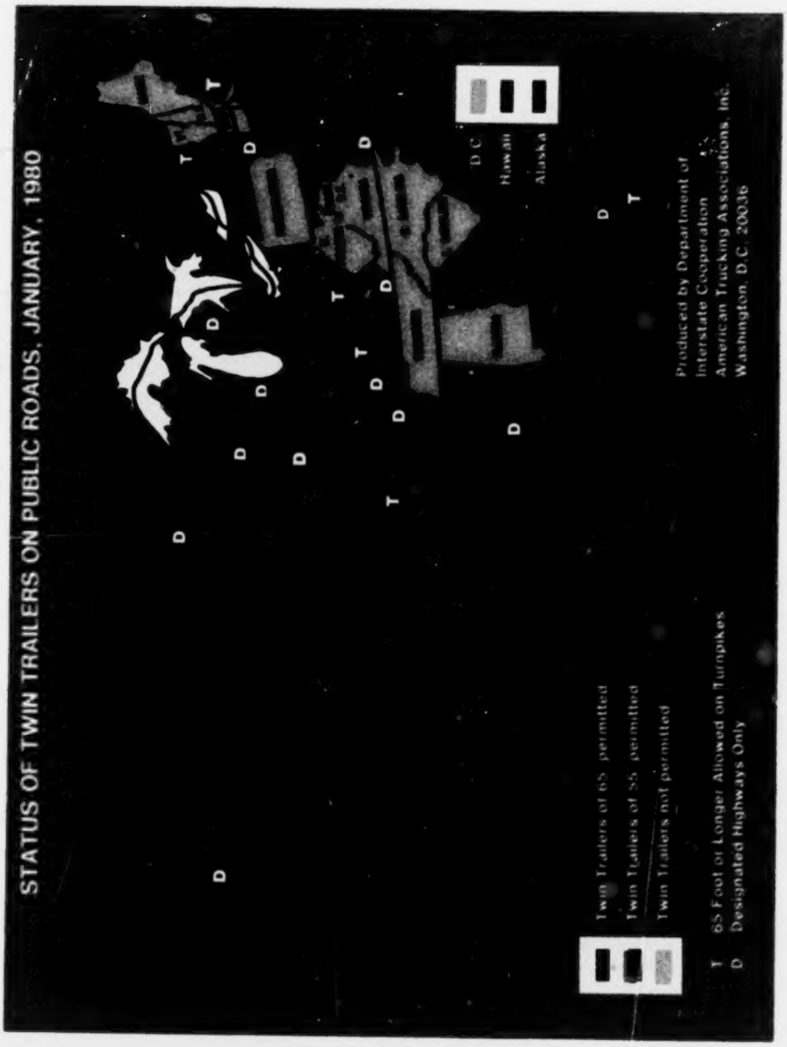

STATUS OF TWIN TRAILERS ON PUBLIC ROADS, JANUARY, 1980
D
T
D.C.
Hawaii
Alaska
Twin Trailers of 65' permitted
Twin Trailers of 55' permitted
Twin Trailers not permitted
T 65 Foot or Longer Allowed on Turnpikes
D Designated Highways Only
Produced by Department of
Interstate Cooperation
American Trucking Associations, Inc.
Washington, D.C. 20036

EXHIBIT 18

ANALYSIS OF STATISTICAL STUDIES

April 30, 1979

ACCIDENT FACTOR CATEGORIES

Driver Factors

Roadway Factors

Traffic Factors

Weather and Light Factors

Vehicle Factors

We are examining the effect on accidents of one component of a vehicle factor—vehicle configuration.

* * * *

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PRINCIPAL STATISTICAL STUDIES

		Geo. Region	Time Period	Miles	Basis Miles	Accident Basis	Accident Rate	Injury Rate	Fatality Rate	Other
U.S. DOT Bureau of Motor Carrier Safety		National	'69-'77	Over 3 billion	Actual Reported	Over $2,000 or injury or fatality	Twins significantly below semis	Twins significantly below semis	Twins significantly below semis	
Iowa DOT		National	'74	N/A	Actual Reported	Unknown	Twins significantly below semis	Unknown	No significant difference	
No Technology	Uncorrected	California	'74	Est. From Counts	Est. from 11 rural, 4 urban stations	Injury or fatal accidents on CHP patrolled roads only (est. all accidents)	No significant difference	No significant difference	Twins significantly higher than	No significant difference in fatal accidents
	Corrected				Est. from 11 rural stations		No signifcant difference		No significant difference	
	Ton Mile Basis (Uncorrected)				Est. from 11 rural 4 urban stations		Twins signicantly below semis	Twins significantly below semis	No significant difference	
California Highway Patrol		California	'72	Est. From counts	Est. from counts at counting stations for CHP patrolled roads only	Rural CHP Injury or Fatality	No significant difference in fatal and injury accident rates			No significant difference in people killed and injured per accident with twins and semis
Consolidated Freightways 1978		National	'78	Over 390 million	Actual Reported	All	No significant difference	No significant difference	No significant difference	
Consolidated Freightways 1970-1978		National	'70-'78	Over 2 billion	Actual Reported	All over $250 or injury or fatality	Twins significantly below semi; from testimony		No significant difference	

ANALYSIS OF BMCS STUDY

—Twins have significantly lower accident rate.

—Twins have significantly lower injury rate.

—Twins have significantly lower fatality rate.

* * * *

1978 CF ACCIDENT RATES

Mileages	Twins	Semis
	239,884,377	153,658,250
Accidents*		
Fatalities	6	11 (7)
Injuries	130	165 (106)
Total Accidents	706	723(463)
Rates		
Fatality	.0250	.0456
Injury	.542	.690
Total Accidents	2.94	3.01

* * * *

1978 CF Road Accidents by Accident Type

ACCIDENTS

	Twins			Semis*		
Accident Type	Total	Fat.	Inj.	Total	Fat.	Inj.
Head-On	10	3	7	6 (4)	3 (2)	2 (1)
Parked	33	1	4	36 (23)	0	0
Stopped	11	0	3	11 (7)	0	3 (2)
Intersection	16	0	6	9 (6)	2 (1)	9 (6)
Jackknife	86	0	11	34 (22)	0	6 (4)
Turning	21	0	4	81 (52)	2 (1)	3 (2)
Passing	39	0	8	56 (36)	0	17 (11)
Ran Off Road	28	0	7	37 (24)	0	5 (3)
Rear-End	72	0	33	95 (61)	0	66 (42)
Sideswipe	99	0	7	112 (72)	0	12 (8)
Skidding	24	0	3	28 (18)	0	14 (9)
Upset	120	0	27	28 (18)	0	17 (11)
Animal	38	1	6	45 (29)	5 (3)	5 (3)
Other	109	1	4	142 (91)	0	6 (4)
	706	6	130	720 (463)	12 (7)	165 (106)

* * * *

POSSIBLE HYPOTHESES THAT SUPPORT SYSTEMATIC BIASES IN SEMI AND TWIN ACCIDENT RATES:

- Driver

  Twin drivers are older and more experienced and therefore safer drivers than semi drivers, thereby reducing twins' accident rates.

- Weather and Light

  Twins travel proportionately more miles in better weather or light conditions than semis, thereby reducing twins' accident rates.

- Roadway

  Twins travel proportionately more miles on four-lane divided highways than semis, thereby reducing twins' accident rates.

- Mechanical Condition

  Twins are better maintained than semis, thereby improving twins' accident rates.

- General

  Unknown factors or combinations of factors connected with differences in semi and twin operations reduce twin accident rates.

IN ALL RESPECTS ANALYSIS OF DATA SHOWS EACH OF THESE HYPOTHESES TO BE IMPROBABLE.

Driver

Hypothesis:

> Twin drivers are older and more experienced and therefore safer drivers than semi drivers, thereby reducing twins' accident rates.

Conclusion:

Improbable. No appreciable differences exist.

—CF does not select drivers for semis or twins on basis of age, experience, or accident record.

—Carriers generally not likely to use different drivers.

—Analysis of CF's 1978 trips shows average driver age per semi trip to be within 44 hundredths of a year of the average driver age per twin trip (43.62 and 44.06 years respectively), a difference much too slight to matter.

—Analysis of 1978 twin and semi accidents showed no significant variation in drivers' age, years of CF experience, number of previous CF accidents, or average number of CF accidents per CF year of experience.

* * * *

Weather and Light

Hypothesis:

Twins travel proportionately more miles in better weather or light conditions than semis, thereby reducing twins' accident rates.

Conclusion:

Improbable. No significant difference seems present.

—California studies do not vary significantly from national studies. Semis and twins would have same weather conditions in California studies.

—Twins appear in general to run in worse winter weather because of twin routes in northern U.S.

—Analysis of 1978 semi and twin accidents shows no significant difference in twin and semi accident rates for accidents occurring in adverse weather conditions.

—Analysis of 1978 semi and twin accidents shows no significant difference in accident rates under adverse light conditions (dark, dusk, and dawn).

* * * *

1978 CF Accidents by Road Condition

	ACCIDENTS	
Road Condition	Twins	Semis*
Dry	400	445 (285)
Ice	147	89 (57)
Snow	61	50 (32)
Wet	76	126 (81)
Other Adverse (mud, oil, chuckhole, etc.)	22	12 (8)
	706	722 (463)

Note: *Semi accident numbers are normalized by the ratio of twin mileage to semi mileage. The numbers in parentheses are the observed numbers.

* * * *

Roadway Types

Hypothesis:

Twins travel proportionately more miles on four-lane divided highways than semis, thereby reducing their accident rates.

Conclusion:

Improbable. Analysis indicates that twins travel more miles on undivided highways than semis.

—Analysis of 1978 accidents shows that twins operate proportionately more on undivided highways than semis for any reasonable range of ratios for accident rates on divided and undivided highways.

* * * *

General

Hypothesis:

> Unknown factors or combinations of factors connected with differences in semi and twin operations reduce twins' accident rate.

Conclusion:

> Improbable. Such factors do not appear to exist to a degree sufficient to reverse general findings.

—If factors are associated with regional differences between states permitting and not permitting twins, then semis should have better driving records in those states where twins are driven than in those states where only semis are driven. Analysis shows no significant difference in accident rates between those regions, but does show a significantly higher semi injury rate in states where both twins and semis are driven.

—A matching of semi and twin trips to ensure similar operating conditions resulted in a controlled sample of 188,296 semi and 188,296 twin trips. No significant differences were observed in accident, injury, or fatality rates for those trips.

Matched Run Analysis

	Twins	Semis
Trips	188,296	188,296
Mileage	56,100,018	56,100,018
Accidents		
Fatalities	1	1
Injuries	17	27
All Accidents	106	100
Rates		
Fatality	.018	.018
Injury	.303	.481
All Accidents	1.89	1.78

EXHIBIT 21

EFFECT OF IOWA'S BAN ON ACCIDENTS

TOTAL CF ACCIDENT INCREASE DUE TO IOWA BAN

—Added Miles: 3,048,152.

—Accident Rate on Divided (Interstate) Highway = 2.12.

—Accident Rate on Undivided Highway = 4.25.

—If all of the added miles are on Interstate the additional accident burden is 6.5 accidents per year.

—If all of the added miles are on undivided highways the additional accident burden is 13 accidents per year.

—A reasonably conservative estimate of the division of divided and undivided mileage would be 50% each (the true division probably has a larger percent of undivided).

—Based on the assumed division of mileage, a reasonable estimate of the additional accident burden is about 10 accidents per year for CF.

—Presumably, other carriers have proportionately similar accident burdens created by the Iowa ban.

EXHIBIT 29

ROAD WEAR ANALYSIS

CASE STUDIES

BIOGRAPHY

Prof. Eldon J. Yoder
433 Maple Street
W. Lafayette, Indiana 47906

April 30, 1979

Bases

1. The AASHTO method is used throughout.
2. Equivalent single 18,000 pound axles [EAL] are calculated for concrete pavement.

   Terminal Serviceability is $P_t = 2.5$.
3. Determinations are for nine- and ten-inch concrete pavements where possible.
4. Front or steering axle weight is 9,000 pounds.
5. Vehicle empty weights are:

Twin		Semi	
Tractor	11,200	Tractor	13,700
Dolly	2,650		
Twin Van (1)	6,750	45′ Trailer Van	10,500
Twin Van (2)	6,750		
Driver	200	Driver	200
Maximum Fuel	1,400	Maximum Fuel	1,400
Total Pounds	28,950	Total Pounds	25,800

* * * *

SUMMARY OF EAL VALUES

	9-inch Concrete		10-inch Concrete	
Case	Semis	Twins	Semis	Twins
1. 73,280 Gross	3.055	2.495	3.035	2.495
2. 80,000 Gross	3.895	3.855	3.930	3.855
3. 73,280 Gross CF Distribution	2.900	2.531	2.900	2.531
4. Iowa 1975 Study 65,000 and 63,000	1.525	1.255	—	—
5. Iowa Average W4 Form S* (All Rural and Interstate)	1.236	0.998	—	—

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* All rural in 1975.

EXHIBIT 53

* * * *

SUMMARY, STATUTES, REGULATIONS, and ADMINISTRATIVE POLICIES RELATING TO EXEMPTIONS FROM GENERAL SIZE AND WEIGHT LIMITS ON VEHICLE MOVEMENTS IN IOWA

* * * *

APPENDIX A

EXEMPTIONS FROM SIZE, WEIGHT, AND LOAD REQUIREMENTS OF VEHICLE MOVEMENTS IN IOWA*

Description of Exemption	Authority
1. Implements of husbandry temporarily moved on highway, moved between a retail seller and purchaser within a 50-mile radius of corporate limits where retail business is located, or received or moved by a retailer in exchange for an implement purchased, except on interstate.	Section 321.453, Code of Iowa
2. Sixty-foot truck tractor and trailer combination for movement of livestock. Also, vehicles which do not exceed length limit can pull portable livestock loading chute not in excess of 13 feet.	Section 321.457, subsections 3 & 4, Code of Iowa
3. Sixty-foot exemption for mobile home and its towing unit if mobile home is not in excess of 48 feet.	Section 321.457, subsection 4, Code of Iowa

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* General limits are as follows:

width: 8′
height: 13′6″
lenght: 55′ for truck tractor trailer combination
60′ for twin trailer combination
40′ for single truck
weight: 73,280 lbs. with additional limits based on length between axles

	Description of Exemption	Authority
4.	Combination of vehicles (not in excess of 60 feet) where load extends 3 feet beyond front and rear bumpers if total length does not exceed 65 feet for transportation of passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, and boats. Also, farm and industrial tractors, and farm implements of husbandry may be transported on 60 foot vehicles.	Section 321.457, subsection 5, Code of Iowa
5.	Exemption in Iowa border cities for operation of motor vehicles operated on state highways if within commercial zone of border city which has passed an ordinance authorizing such movement and if length and weight are in conformity with laws of abutting state on July 1, 1974.	Section 321.457, subsection 7 and ordinances passed in cities of Akron, Bettendorf, Clinton, Council Bluffs, Davenport, Dubuque, Hawarden, and Sioux City
6.	Exemption for movement of truck trailers manufactured or assembled in Iowa for purpose of movement to another point of manufacture or assembly in Iowa or to a point outside Iowa. Limited to 70′ length and 10′ width and movement on 4-lane highways or 24′ roadways.	Section 321E.10, Code of Iowa
7.	Exemption from gross weight limits of Section 321.463 for manufacturers of machinery or equipment manufactured or assembled in Iowa over distance not to exceed 25 miles at a speed not to exceed 20 mph.	Section 321E.7, Code of Iowa
8.	Annual permits for indivisible loads. Various limitations depending upon overall length and width of vehicle and load. Unlimited mileage and trips for vehicles and load not in excess of: (a) 70′ length; (b) 12′5″ width; (c) 13′10″ height; (d) weight limits of Section 321.463.	Section 321E.8, Code of Iowa

	Description of Exemption	Authority
9.	Single trip permits for indivisible loads. Unlimited distance over specified routes. Limits on length range from not in excess of 80′ to not in excess of 120′ depending upon width, weight and height requirements.	Section 321E.9, Code of Iowa
10.	Single trip permits for movement of mobile homes and factory-built structures. Width can exceed 12′5″ but cannot exceed 14′5″. Mobile home or structure cannot exceed 67′6″ and mobile home or structure and power unit cannot exceed 85′ in length. Permit granted only if destination or origin is in Iowa and only for a resident of Iowa. "Resident" includes a mobile home dealer or manufacturer licensed in Iowa or or manufacturer of factory-built structures in Iowa.	Section 321E.28, Code of Iowa
11.	Annual permits for movement on interstate exceeding 25 miles for road construction machinery, equipment or material and agricultural machinery, equipment and materials if they are to be used within the state of Iowa or are manufactured or assembled in Iowa. Limits: length —70′0″ width —11′9″ height —13′10″ weight —73,280 lbs.	I.A.C. Section 820-[07F] 2.1(15)(b)(321E)
12.	Special permit for divisible loads for special or emergency situations. Example contained in letter from Jon McCoy to State Senator Cloyd Robinson dated 4/19/78 using special permits to aid House Moving Industry.	Section 321E.29, Code of Iowa. Section 820-[07F] 2.3(2)(g), I.A.C., in defining special or emergency situation, includes uncommon or extraordinary circumstances where movement is essential to the existence of an Iowa business and may be accom-

Description of Exemption	Authority
	plished without undue hazard to traveling public or to private or public property.
13. Governor Emergency Proclamations. Issued by Governor Ray during last few yrs. to permit movement of fuel, grain, livestock, feed during situations of drought, severe winter weather, fuel shortages, harvest time.	Authority exists in Section 29C.6, Code of Iowa, for Governor to declare a state of disaster emergency and DOT has authority to issue special permits under Section 321E.29, Code of Iowa.
14. Movement of hay, straw, or stover may be moved even in absence of special or emergency situations. Load can be divisible.	Sections 321E.29 and 321.454, Code of Iowa. Provision for hay, straw and stover added by Acts 1978 (67th G.A.) Ch. 103, Section 54 and Ch. 1113, Section 41. Proposed regulations of DOT permit width of 12′5″, length as permitted in Section 321.457, height of 13′10″, and weight not to exceed 73,280 lbs. or license class tonnage.
15. Export ship containers which exceed weight limits of Iowa bridge formula granted annual or single trip permits. Considered indivisible loads even though they contain grain.	Memo from Dennis Ehlert dated 5/30/73
16. Prohibition against spilling, dropping, sifting, or leaking any part of load on highway does not apply to loads of hay, stover, raw farm products, soil fertilizers, raw dairy products or livestock, live poultry, or eggs.	Section 321.466, Code of Iowa

	Description of Exemption	Authority
17.	Exemption from maximum weight on any one axle, including a tandem axle, of a vehicle hauling livestock as long as maximum weight on group of axles does not exceed statutory limit.	Section 321.463, Code of Iowa
18.	Warning devices on overlength vehicles and loads required only if in excess of 65′.	Section 321.24, Code of Iowa

APPENDIX B

* * * *

Section 321E.10. Truck trailers manufactured in Iowa. The department or local authorities may in their discretion and upon application issue annual trip permits for the movement of truck trailers manufacured or assembled in this state that exceed the maximum length specified in section 321.457 and the maximum width specified in section 321.454. Movement of such truck trailers shall be solely for the purpose of delivery or transfer from the point of manufacture or assembly to another point of manufacture or assembly within the state or to a point outside the state, shall be only on roadways of twenty-four feet or more in width or on four-lane highways, shall be on the most direct route necessary for such movement, and shall display the special plates designated in section 321.57. All truck trailers under permit for such movement shall contain no freight or additional load. All truck trailers under permit for such movement shall be at a speed not to exceed forty-five miles an hour or the established speed limit whichever is lower. No vehicle or combination of two or more vehicles inclusive of front and rear bumpers, including towing units, involved in the movement of truck trailers shall exceed seventy feet in length and an overall width of ten feet. . . .

* * * *

APPENDIX D

* * * *

Definition of special or emergency situations for issuance of special permits under Section 321E.29, as explained in Candace Bakke deposition, pg. 80, has been amended to add:

> "Or circumstances where the movement is essential to insure safety and protection of any persons or property; . . . or where weather or transportation problems create an undue hardship for the citizens of the State of Iowa or the transporter."

APPENDIX E

OVER-DIMENSIONAL PERMITS

1977

MONTH	ANNUALS	SINGLES	MOBILE HOMES
January	822	2002	*
February	984	2936	*
March	1288	3002	*
April	1240	3147	*
May	794	3914	*
June	860	4263	*
July	632	4278	103
August	704	3271	222
September	484	4589	436
October	624	3754	298
November	460	2862	205
December	458	3548	200
1978			
January	785	3580	158
February	932	2276	120
March	1133	2406	164
April	1235	3010	187
May	921	3855	361
June	896	3554	369
July	888	3244	274
August	591	4468	371
September	693	4683	487
October	526	4940	284
November	481	4147	298
December	580	3677	227

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* Total of mobile home permits included in singles or annuals. No information on file.

DEPARTMENT OF TRANSPORTATION

MOTOR VEHICLE DIVISION
OFFICE OF OPERATING AUTHORITY
PERMIT CENTER,
5238 N.W. 2nd Ave., Des Moines, Iowa 50313
March 7, 1978

* * * *

In reference to your telephone call of today, the following information is available on overdimensional permits issued:

July 1, 1975 to June 30, 1976	46,500
July 1, 1976 to June 30, 1977	50,800

Information previous to this would have to be obtained from our records center.

Yours Truly,

/s/ Carol Spence
CAROL SPENCE
Supervisor
Permit Center

APPENDIX M

GOVERNOR'S VETO MESSAGE

(House File 671)

March 2, 1974

The Honorable Andrew Varley
Speaker of the House
Sixty-fifth General Assembly
State Capitol Building
Local

Honorable Members of the House:

I am returning herewith House File 671, an Act relating to the overall length of combinations of vehicles, disapproved and without my signature, to the House of Representatives in accordance with Article III, Section 16, of the Constitution of the State of Iowa.

The primary purpose of this bill is to increase the maximum length of twin trailer trucks from sixty to sixty-five feet for operation in Iowa.

I have heard many arguments in favor of and against this particular piece of legislation. Early in this session, in my special energy and transportation message to the General Assembly, I said there would be ". . . some value both to Iowa industry and to energy efficiency if additional length only could be utilized by trucks originating at, or destined to, points in Iowa."

Then, as now, I find sympathy with those who are doing business in our state and whose enterprises could gain from increased cargo carrying ability by trucks. However, with this bill, the Legislature has pursued a course that would benefit only a few Iowa-based companies while providing a great advantage for out-of-state trucking firms and competitors at the expense of our Iowa citizens.

I have supported changes in our trucking laws where the benefits to commerce could be realized without overburdening costs and sacrifices to and by our people.

For example, in the last session I approved the change in the Iowa law to permit longer length for auto transports and this session I have supported the measure to permit trucks that are legal in adjoining states to operate in commercial areas of our border cities.

Neither of these measures brings with it the problems of House File 671.

The issue of longer trucks has for the most part been controversial and charged with emotion. This is understandable because this is a subject that involves the life and lifestyles of all the people who use our system of highways as a mode of personal transportation or as a means of sending and receiving goods.

In considering this bill, however, I set the emotional arguments aside and looked at the question of whether to approve or disapprove it on the basis of the best information and facts that I could assemble from proponents and opponents of the bill, weighing both the advantages and disadvantages.

It has been argued that Iowa is the only state in the nation with the limit of sixty feet for twin trailer trucks. It should be pointed out, however, that 19 other states in the nation limit overall length of trucks to not more than 55 feet and some states don't even allow twin trailer trucks.

Some have argued that the present limitation to a sixty-foot truck length is adversely affecting business activity in Iowa. While some might be able to cite an individual case in point, nevertheless the Iowa economy has grown faster than surrounding states, most of which do allow bigger trucks.

Using data from 1972, the most recent available, total personal income (one of the most widely accepted measures of economic growth) advanced in Iowa by 12.6 percent compared to 9.5 percent in the Plain States and 8.9 percent for the United States.

Proponents of longer trucks emphasize the impact on manufacturing. But in 1972, personal income in manufacturing grew faster in Iowa than in any state in the Plains Region—12.5 percent compared to 10.3 for the Plains and 9.6 for the United States.

In addition, truck traffic in Iowa—without the extra-sized trucks—has continued to increase during each of the last four years from 11 to 13 percent.

Many different statistics relative to safety records for trucks can be cited. We believe some of the best available data come from the National Safety Council which indicate that twin trailers have fewer accidents than passenger cars comparing the same number of miles driven. But, they have a much higher fatality rate among the accidents that do occur. The 1973 accident facts of the National Safety Council show that these trucks have 2.3 percent of our accidents but account for 6.6 percent of our fatalities. My point in mentioning this at all is that if we have thousands more trucks crossing our state, there will be millions of additional miles driven in Iowa and that does create a genuine concern for safety.

This bill basically opens our state to literally thousands and thousands more trucks per year, most of which will travel on one highway east and west, which is I-80. This highway has been described as one which is already overcrowded, congested and breaking up because of wear and tear.

These interstate highways were built with the use of federal funds, money which has come from the pockets of Iowa citizens as well as others, but the maintenance and repair of them are exclusively borne by state revenues. True, fees each truck pays provide some of that cost, but the Highway Commission advises that each truck does not pay its share of cost of maintaining the highways compared to passenger vehicles. No one can predict exactly how many more trucks would travel across Iowa as a result of this bill, but if this bill were to become law, already we are advised one out-of-state truck company alone plans more than 50,000 additional trips across the State of Iowa.

Our highways are for the purpose of moving people and commerce and there has to be some limitations to maintaining a balance for the use of all.

To keep in perspective the relationship between trucks and passenger cars, it is interesting to note that research shows that one truck with an 18,000 lb. axle limitation creates as much stress on a highway as 5,000 average-sized passenger cars.

Rapidly escalating costs for highway construction and maintenance are already straining the state's ability to keep highways in satisfactory repair. Yet this bill, that would permit thousands more trucks which would create tremendous additional wear and tear, totally ignores the issue of any additional fees for any extra size.

In addition, the wording of this bill has created real division of opinion over whether or not the bigger trucks would be limited to only 4-lane highways or points within 5 miles of 4-lane highways, or in fact these longer trucks could travel indiscriminately on practically any Iowa highway.

If the one opinion should prevail that says this bill limits travel within 4-lane corridors, then the many areas of this state, both large and small, that are not served by 4-lane highways could be severely disadvantaged in any effort to attract new industry. Their ability to entice new development for their communities would be seriously reduced when they would not have access to bigger trucks while other Iowa communities on or close to 4-lane highways would.

Where manufacturing plants already exist, but are not located on approved highways for bigger trucks, these companies would most certainly be put in a competitive disadvantage.

But what if, on the other hand, the opinion should prevail that says these bigger trucks could travel on any highway in our state so long as they would go to some point within 5 miles of a 4-lane highway? This would open our state to the bigger trucks for all of our highways even though the great majority of our roads could not accommodate any of these trucks under any circumstances. This, of course, could be disastrous.

Oddly enough, the Legislature had before it an opportunity to clarify the construction of this confusing and controversial language, but refused to do so. Either construction of this section of the bill, plus the ambiguity, give strong reason to disapprove the entire measure.

It is unfortunate that Iowa does not have a Department of Transportation which could have been so helpful in ascertaining the desirability of any change of the size of trucks that are allowed in our state. A DOT would be charged with the responsibility of determining our overall transportation needs and tolerances. In any event, that kind of counseling was not available to either the Legislature or me as Governor.

In my special energy and transportation message to the Legislature, I mentioned that the General Assembly should also consider from where the fuel would come for the many thousands more trucks that this bill would invite.

Since that time a number of events have transpired, including a truck strike, and a response from the federal government to the strike and to the truckers. The Director of the Federal Energy Office has assured the truckers that they will have 100 percent of their fuel needed. Consequently, I am assuming that Mr. Simon's word would be kept and that the Federal Energy Office would make fuel available for additional trucks even though we do not know from where or from whom that fuel would come.

Nevertheless, I have not been very impressed with the arguments of those who claim that the reason we should allow these many extra larger trucks into our state is in the interest of energy efficiency. If energy conservation were the genuine motive of those who favored longer trucks, then someone might well have offered to make the legislation effective only for the duration of the energy emergency as the Legislature did with the 55 miles per hour speed limit. But no one did.

For the many reasons I have touched upon in this letter, I hereby respectively disapprove of this House File 671.

Sincerely,

ROBERT D. RAY
Governor

* * * *

EXHIBIT 55

LEVEL OF SERVICE ANALYSIS

U.S. HIGHWAY 36 IN MISSOURI

INTERSTATE HIGHWAY 80 IN IOWA

by: JACK E. LEISCH & ASSOCIATES
1603 Orrington
Evanston, Illinois 60201
Telephone: 312-866-9490

* * * *

5. *Level of Service*: I-80 is generally "A" throughout, while U.S. 36 has an "A" level of service along the the four-lane sections and "B" along the two-lane sections.
6. *Accident Experience*: The non-fatal accident rate for 1975 on Missouri Federal Aid primary roads was approximately 2.2 times the non-fatal accident rate on Iowa completed interstate highways for the same year. Source: Fatal and Injury Accident Rates on Federal Aid and Other Highway Systems/ 1975," U.S. Department of Transportation, 1976.]

* * * *

D. *COMPARISON OF I-80 and U.S. 36—IMPACT OF TRUCK TRAFFIC*:

1. *Accidents—Actual*: Due to a lower quality alignment, less control of access, and many two-lane segments on U.S. 36 compared to I-80, U.S. 36 has a greater overall accident

rate as well as a higher truck involvement accident rate than I-80.

2. *Accidents—Potential*: An increase in truck volume on U.S. 36 would cause a larger increase in the number of accidents than an equal increase in truck volume on I-80.

3. *Level of Service*: The effect of trucks reducing the level of service is greater on a two-lane highway than on an Interstate for identical percentages of trucks. This means that the capacity of a two-lane highway is reduced by a greater percent than of an Interstate for the same percent of trucks in the traffic stream. The effects on four-lane divided highways are identical to those on Interstates. Current levels of service on I-80 are generally higher than those on U.S. 36.

4. *Scenario of Operating Environment*: I-80 is more ideal for a mix of trucks and autos, since its four lanes allow easy passing maneuvers of slower trucks at all times, and its full control of access not only never requires trucks to stop, involving acceleration and deceleration, but also eliminates any frictional effect of roadside development and intersections. I-80 is currently operating at a lower volume-to-capacity ratio (higher level of service) than U.S. 36, enabling it to more easily accept additional traffic volume of any and all classifications without a major reduction in quality of traffic flow.

III. *MODEL OF FUTURE CONDITIONS*

A. *NO SHIFT OF TWIN TRAILERS FROM U.S. 36 TO I-80:*

1. As the auto and truck volumes increase on the two facilities, the total number of accidents on each will increase; but there will always be more accidents per vehicle mile traveled on U.S. 36 than on I-80.

2. Since U.S. 36 is presently operating closer to capacity than is I-80, a given percentage volume increase will lower the level of service on U.S. 36 more drastically than on I-80. However, if volume increases on U.S. 36 are of lower percentages than on I-80 (as has been postulated), the effects on the two facilities' levels of service would be similar.

3. With no shift of twin trailers from U.S. 36 to I-80, the design level of service for both urban and rural sections of I-80, with the exception of a segment of less than three miles, will not be surpassed in 1990.

B. *SHIFT OF TWIN TRAILERS FROM U.S. 36 TO I-80*:

1. Since trucks (and vehicles in general) experience a higher accident rate on U.S. 36 than on I-80, the shifting of trucks would cause a larger decrease in the number of accidents on U.S. 36 than the expected increase in accidents on I-80, for a net decrease in the total number of accidents on the two facilities. Accidents would further

be reduced by the twin trailers traveling fewer total miles, if shifted to I-80 in Iowa.

2. A given percentage of trucks in the traffic stream has a greater effect upon the level of service of two-lane highways than of Interstates. A shift of a given number of twin trailers represents a larger proportion of the capacity of U.S. 36 than of I-80. Consequently, the shifting of twin trailers from U.S. 36 to I-80 would have a greater beneficial effect upon the level of service of U.S. 36 than detrimental effect upon I-80. The net benefit would be an overall increase in the level of service on the two facilities combined.
3. With the shift of twin trailers from U.S. 36 to I-80, the design level of service of both urban and rural sections of I-80, with the exception of a segment of less than three miles, will not be surpassed in 1990.

Exhibit 62

* * * *

Photographs showing front, side, and top view of the following group of vehicles:

- 55 foot semi,
- 60 foot livestock carrier,
- 60 foot twin trailer,
- 65 foot twin trailer, and
- 65 foot auto carrier (includes 5 foot overhang)

All vehicles shown, except the 65 foot twin trailer, are legal throughout Iowa. The 65 foot twin trailer is legal in certain border cities of Iowa.

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CF
24-1516
CF
92317
16-4835
CF
16-5061

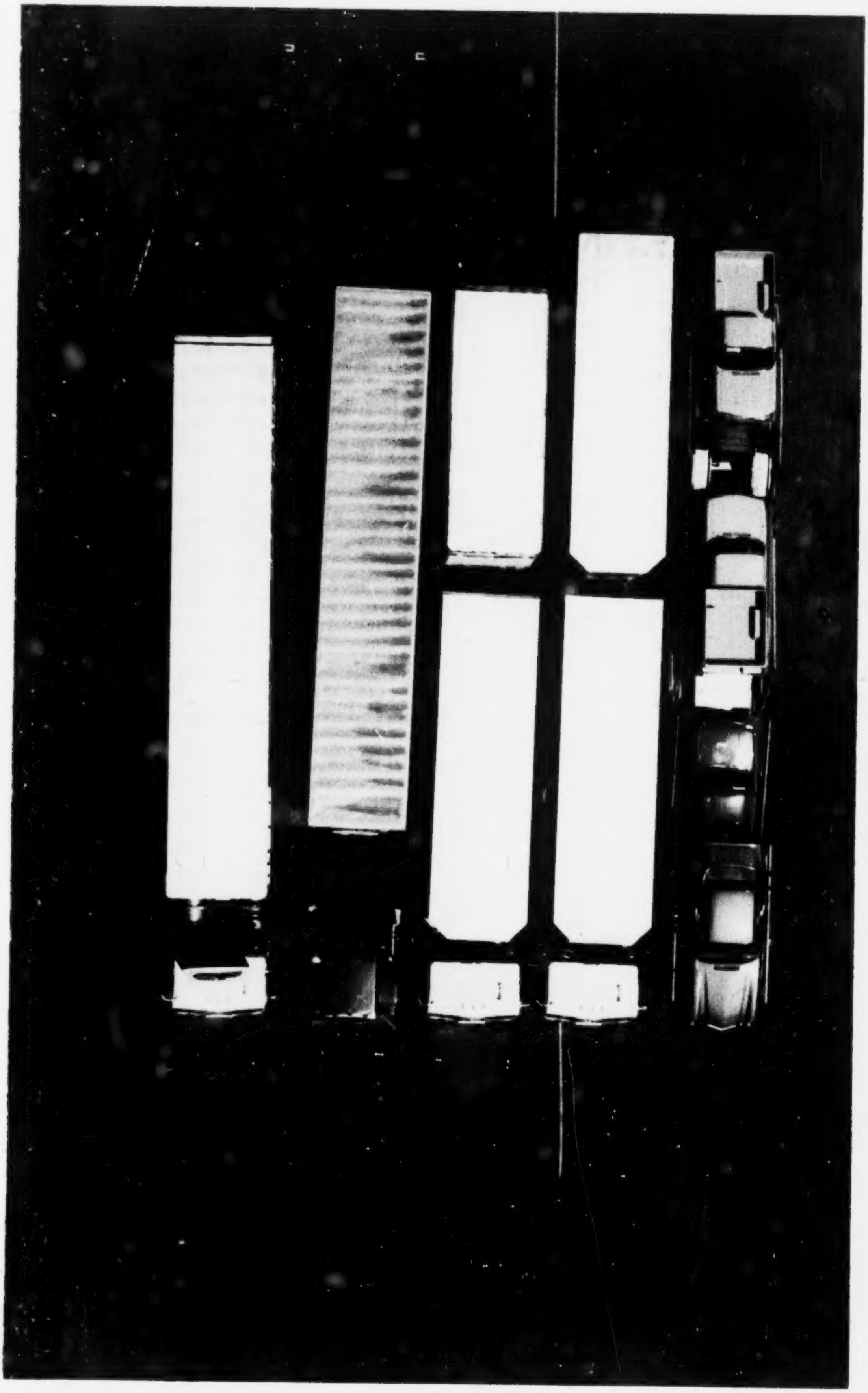

EXHIBIT 64

GOVERNOR'S VETO MESSAGE
(House File 48)

OFFICE OF THE GOVERNOR

March 16, 1972

The Honorable William H. Harbor
Speaker of the House
Sixty-fourth General Assembly
State Capitol
Local

Honorable Members of the House:

I am returning herewith House File 48, the bill relating to the movement of oversized mobile homes and vehicles, disapproved and without my signature to the House in accordance with Article III, Section 16 of the Constitution of the State of Iowa.

* * * *

This bill also would make Iowa a bridge state as these oversized units are moved into Iowa after being manufactured in another state and sold in a third. None of this activity would be of particular economic benefit to Iowa.

* * * *

Sincerely,

ROBERT D. RAY
Governor

* * * *

Exhibit 68

COMPARISON OF BMCS DATA WITH AND WITHOUT CONSOLIDATED FREIGHTWAYS TO DETERMINE BIASES

CF included in 1970 through 1973 data

1970 through 1973 average twin rate per year = .671
1970 through 1973 average semi rate per year = .867

$$\frac{\text{Twins}}{\text{Semis}} = .77$$

CF not included in 1974 through 1976 data

1974 through 1976 average twin rate per year = .632
1974 through 1976 average semi rate per year = .812

$$\frac{\text{Twins}}{\text{Semis}} = .78$$

CF was somewhat less than 50% of the total sample in 1970 through 1973. If one assumes that CF data had no bias, the constancy of the twin to semi accident rate ratio is evidence of no bias in remaining carriers. If such a bias accounted for a better twin rate in 1970 through 1973, then removal of the "neutral" CF data would have sharply improved the twin to semi accident rate ratio shown by the remaining "biased" carriers.

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* Data from Koehtler, Deposition of April 5, 1979, Exhibit 6, page 2.

Exhibit 71

REPORT OF THE

TWIN TRAILER STUDY COMMISSION

To

THE GOVERNOR

And

THE GENERAL ASSEMBLY OF VIRGINIA

[SEAL]

COMMONWEALTH OF VIRGINIA
Department of Purchases and Supply
Richmond
1970

II. FINDINGS

* * * *

[3] B. Twin trailer combinations, not exceeding 65 feet in length and conforming to existing width and weight limitations, may be operated safely and efficiently on four-lane divided highways without interfering with the safety and convenience of motorists.

* * * *

EXHIBIT 511

LEGAL MAXIMUM DIMENSIONS AND WEIGHTS OF MOTOR VEHICLES COMPARED WITH AASHTO STANDARDS

Prepared by the American Association of State Highway and Transportation Officials

December 31, 1978

Line	State or Province	Width inches[1]	Height ft.-in.	Length-feet[2]					Number of towed units[3]			Axle load-pounds				Operating tire inflation pressure pounds per sq. in.	Gross weight limit				Specified maximum gross weight-pounds[4]						Practical maximum gross weight-pounds[5]						Line
				Single unit			Truck tractor semi-trailer	Other combination	Semi-trailer	Full trailer	Semi-trailer and full trailer	Single		Tandem			Pounds per engine net horsepower delivered to clutch or equivalent	Type of restriction	Applicable to:		Truck		Truck-tractor semitrailer			Other combination	Truck		Truck-tractor semitrailer			Other combination	
				Truck	Bus	Semi-trailer or trailer						Statutory limit	Including statutory enforcement tolerance	Statutory limit	Including statutory enforcement tolerance				Any group of axles	Total wheelbase only	2-axle	3-axle	3-axle	4-axle	5-axle		2-axle	3-axle	3-axle	4-axle	5-axle		
1	Alabama	96	13-6	40	40	NS	55	NP	1	NP	NP	20,000	[28]22,000	[14]40,000	[28]44,000	NS	NS	Table		X	40,000	60,000	60,000	75,000	80,000	[14]84,000	30,000	52,000	52,000	74,000	80,000	NP	1
2	Alaska	96	13-6	40	40	45	65	70	NR	NR	NR	20,000		34,000		NS	NS	Formula		X	40,000	54,000	60,000	74,000	86,000	NS	28,000	42,000	48,000	62,000	76,000	114,000	2
3	Arizona	96	[63]13-6	40	40	[7]NS	65	65	1	1	2	20,000		34,000		NS	NS	Table	Under 18'	Over 18'					[43]		28,000	42,000	48,000	62,000	[43]76,000	80,000	3
4	Arkansas	96	13-6	40	40	NS	60	65	NR	NR	NR	[8]18,000		32,000		NS	NS	Spec. maximum			30,000	44,000	48,000	62,000	73,280	73,280	26,000	40,000	44,000	58,000	72,000	73,280	4
5	California	96	[34,9]13-6	40	40	[40]40	60	65	NR	NR	NR	[13]20,000		[28]34,000		NS	NS	Table	X								28,000	42,000	48,000	62,000	76,000	80,000	5
6	Colorado	96	13-6	35	40	NR	65	65	1	3	3	18,000		36,000		NS	NS	Formula-spec. lim.		X					[14]85,000	[14]85,000	26,000	44,000	44,000	62,000	76,000	76,000	6
7	Connecticut	102	13-6	55	55	NR	55	NP	1	NP	NP	22,400	22,848	36,000	36,720	NS	NS	Spec. lim.-tire cap.			[46]32,000	[46]53,800	[46]53,800	[46]67,400	73,000	NP	30,848	44,720	53,800	67,400	73,000	NP	7
8	Delaware	96	13-6	40	42	NR	60	65	1	1	2	20,000		40,000		NS	NS	Table-spec. lim.	X		40,000	65,000	60,000	70,000	80,000	80,000	28,000	[14]51,500	48,000	68,000	80,000	80,000	8
9	Florida	96	13-6	[6]40	40	NS	55	55	1	1	NP	20,000	22,000	40,000	44,000	NS	NS	Table	X		44,000	66,000	66,000	76,000	80,000	80,000	30,000	52,000	52,000	74,000	80,000	80,000	9
10	Georgia	96	13-6	55	55	NR	55	55	1	1	1	18,000	20,340	36,000	40,680	NS	NS	Spec. max.[16]	[16]X						[14]80,000	[14]80,000	28,340	48,680	48,680	69,110	73,280	73,280	10
11	Hawaii	108	13-6	40	40	NR	[10]65	65	1	1	2	24,000	26,400	34,000	37,400	NS	NS	Formula[21,59]	X								33,200	43,700	58,400	68,900	79,400	[14]92,400	11
12	Idaho	[14]102	14-0	40	40	NR	[67]65	75	1	2	3	20,000		[20]37,800		NS	[45]NS	Table[20]-formula[21]	X		40,000	[20]56,700	60,000	74,000	[14]85,500	[14]105,500	28,000	[20]45,800	48,000	[20]64,700	[20]79,000	[14]105,500	12
13	Illinois	96	13-6	42	42	[7]42	55	[24]60	1	1	2	[23]18,000	[48]	32,000	[48]	NS	NS	Spec. lim. tire cap.			36,000	50,000	50,000	64,000	73,280	73,280	26,000	40,000	44,000	58,000	72,000	73,280	13
14	Indiana	96	13-6	35	40	NR	55	65	NR	NR	NR	[64]18,000	19,000	[64]32,000	33,000	NS	NS	Spec. lim. tire cap.							73,280	73,280	27,000	41,000	46,000	60,000	73,280	73,280	14
15	Iowa	96	13-6	40	40	NR	[26]55	[26]55	1	1	2	18,000	18,540	32,000	32,960	NS	NS	Table	X								26,640	40,960	40,960	59,500	73,280	73,280	15
16	Kansas	96	13-6	42'6"	42'6"	NS	65	65	1	2	2	20,000		34,000		NS	NS	Table		X	40,000	54,000	60,000	74,000	[14]85,500	[14]85,500	28,000	42,000	48,000	62,000	76,000	85,500	16
17	Kentucky	96	[27]13-6	[27]35	[27]35	NR	[29]55	65	1	1	2	20,000	[28]21,000	34,000	[28]35,700	NS	NS	Spec. lim. tire cap.-form.	X		40,000	54,000	60,000	74,000	[44]80,000	[44]80,000	28,000	42,000	48,000	62,000	76,000	80,000	17
18	Louisiana	96	13-6	40	40	NR	65	65	2	2	2	20,000	[28]22,000	34,000	[28]37,000	120	NS	Axle lim.-tire cap. 650 lb/in							80,000	[66]88,000	28,000	42,000	48,000	62,000	76,000	[15]88,000	18
19	Maine	[14]102	[9]13-6	45	45	45	55½	55½	1	1	[39]NP	22,000		[14]38,000		NS	NS	Tire cap.-axle spacing	X		34,000	54,000	54,000	69,000	80,000	80,000	30,000	46,000	52,000	68,000	80,000	80,000	19
20	Maryland	96	13-6	40	55	55	55	[30]65	NR	NR	NR	22,400		[38]40,000		NS	NS	Table	X	X		55,000	55,000	65,000	73,280	73,280	30,400	48,000	52,800	65,000	73,280	73,280	20
21	Massachusetts	96	13-6	35	40	45	60	NP	1	NP	NP	22,400		36,000		NS	NS	Table-spec. lim.		X	48,000	60,000	67,200	80,000	80,000	NP	30,400	44,000	52,800	56,400	80,000	NP	21
22	Michigan	96	13-6	40	40	NR	55	[22]65	1	1	2	[22]20,000		[38]34,000		NS	400	Formula [18,21]							[38]80,000	[38]80,000	28,000	42,000	48,000	62,000	76,000	154,000	22
23	Minnesota	96	13-6	40	40	45	60	[27]65	1	1	[22]2	20,000		34,000		NS	NS	Table Formula [38]	X								26,000	40,000	44,000	58,000	80,000	80,000	23
24	Mississippi	96	13-6	35	40	NR	55	55	NR	NR	NR	18,000		28,650	[23]32,000	NS	NS	Table-tire cap.	X								26,000	[22]40,000	44,000	[23]58,000	[23]72,000	[22]73,280	24
25	Missouri	96	13-6	40	40	NR	55	[55]55	NR	NR	NR	[65]18,000		[65]32,000		NS	NS	Table		X					73,280	73,280	26,000	40,000	44,000	58,000	[23]72,000	[23]73,280	25
26	Montana	[14]102	13-6	40	40	NR	60	60	NR	NR	NR	[36]18,000		[36]32,000		NS	NS	Table-formula[21]	Under 18'	Over 18'	[36,21]40,000	[36,21]60,000	[36,21]60,000	[36,21]80,000	[36,21]85,500	[36]105,500	26,000	40,000	44,000	58,000	73,280	76,800	26
27	Nebraska	96	14-6	40	40	[7]NR	60	65	1	1	2	[14]20,000		[14]34,000		NS	NS	Table	X		[14]40,000	[14]60,000	[14]60,000	[14]80,000	[14]85,500	[14]95,000	[14]28,000	[14]42,000	[14]48,000	[14]62,000	[14]77,500	[14]80,500	27
28	Nevada	96	14-0	40	40	NR	70	75	NR	NR	NR	20,000		34,000		NS	NS	Table	X		40,000	60,000	60,000	80,000	80,000	80,000	28,000	42,000	48,000	62,000	76,000	80,000	28
29	New Hampshire	102	13-6	35	40	NR	55	55	1	1	NP	22,400		36,000		NS	NS	Table-spec. lim.		X	33,400	[14]55,000	52,800	66,400	80,000	80,000	30,400	44,000	52,800	66,400	80,000	80,000	29
30	New Jersey	96	13-6	35	[42]35	35	55	55	2	2	2	22,400	23,520	34,000	35,700	NS	NS	Axle lim.-tire cap.									31,520	43,700	55,040	67,220	79,400	80,000	30
31	New Mexico	96	13-6	40	40	NR	65	65	1	1	2	21,600		34,320		NS	NS	Table	Under 18'	Over 18'							29,600	42,320	51,200	63,920	76,640	86,400	31
32	New York	96	13-6	35	40	NR	55	55	2	2	2	22,400		36,000		NS	NS	Formulas		X					80,000	80,000	30,400	44,000	52,800	66,400	80,000	80,000	32
33	North Carolina	96	13-6	[6]40	[6]40	NR	55	55	1	1	NP	19,000	20,000	36,000	38,000	NS	NS	Formula[61]		Over 36'	31,500	49,875	49,875	67,200	79,800	79,800	28,000	46,000	46,000	66,000	79,800	79,800	33
34	North Dakota	[22]102	13-6	40	40	NR	65	65	1	1	2	20,000		34,000		NS	NS	Formula, tire cap.[21]		X							28,000	42,000	48,000	62,000	76,000	76,000	34
35	Ohio	96	13-6	40	40	45	60	65	1	NR	NR	20,000		[44]24,000		NS	NS	Formula[59]			40,000				80,000	80,000	28,000	42,000	48,000	62,000	76,000	80,000	35
36	Oklahoma	[14]102	13-6	40	45	NR	65	65	1	1	2	20,000		34,000		NS	NS	Table	X		[47]20,000	[47]40,000	64,000	[14]80,000	[14]85,500	[14]90,000	28,000	42,000	48,000	62,000	76,000	76,800	36
37	Oregon	96	13-6	40	40	[22,40]35	[22]60	[22]75	1	1	2	[49]20,000		34,000		NS	NS	Formula[21]	X						80,000	80,000	28,000	42,000	48,000	62,000	76,000	80,000	37
38	Pennsylvania	96	13-6	40	40	NR	55	55	1	1	NP	22,400	23,072	36,000	37,080	NS	[32]450	Table			44,800	58,400	50,000	60,000	73,280	73,280	31,072	45,080	51,500	61,800	73,280	73,280	38
39	Rhode Island	102	13-6	40	40	40	55	55	1	1	NP	22,400		NS		NS	NS	Spec. lim.			[50]36,000	[51]44,000	[52]50,000	[53]67,400	73,280	73,280	30,400	44,000	53,800	67,400	73,280	73,280	39
40	South Carolina	96	13-6	[6]40	[6]40	NR	55	55	1	1	NP	20,000		[14]36,000		NS	NS	Spec. lim.			35,000	46,000	50,000	65,000	73,280	73,280	28,000	[14]44,000	48,000	[14]64,000	[14]73,280	73,280	40
41	South Dakota	96	13-6	35	40	NR	70	80	1	1	2	20,000		34,000		NS	NS	Table	X		40,000	60,000	60,000	80,000	[14]85,500	[14]95,000	28,000	42,000	48,000	62,000	76,000	[14]95,000	41
42	Tennessee	96	13-6	40	40	NS	55	55	1	[56]1	NP	[8]18,000		32,000		NS	NS	Spec. lim.		X	30,000	44,000	48,000	62,000	73,280		26,000	40,000	44,000	58,000	72,000	43,500	42
43	Texas	96	13-6	45	40	NR	65	65	NR	NR	NR	20,000		34,000		NS	NS	Formula[21]	X								28,000	42,000	48,000	62,000	76,000	80,000	43
44	Utah	96	14-0	45	45	45	65	65	NR	NR	NR	20,000		34,000		NS	NS	Table	X		40,000	60,000	60,000	80,000	80,000	80,000	28,000	42,000	48,000	62,000	80,000	80,000	44
45	Vermont	[14]102	13-6	60	60	NS	60	60	1	1	NP	22,400	23,520	[57]36,000	37,800	NS	NS	Table-tire cap. 600 lb/in.	X			55,000			90,000	80,000	31,520	55,000	55,000	66,400	80,000	90,000	45
46	Virginia	96	13-6	40	40	NS	55	55	1	1	NP	20,000		34,000		NS	NS	Table		X	40,000	54,000	60,000	72,000	76,000	76,000	28,000	42,000	48,000	62,000	76,000	76,000	46
47	Washington	96	14-0	35	40	45	65	65	1	1	2	20,000		34,000		NS	NS	Table	Under 18'	Over 18'	40,000	40,000	60,000	74,000	80,000	80,000	28,000	40,000	48,000	62,000	76,000	80,000	47
48	West Virginia	96	[33]12-6	[6]40	[6]40	NS	[22]55	[22]55	1	1	NP	20,000		34,000		NS	NS	Table	X		40,000	54,000	60,000	[23]76,500	[23]80,000	[23]80,000	28,000	42,000	48,000	62,000	[23]76,000	[23]80,000	48
49	Wisconsin	96	13-6	35	40	45	[62]55	55	1	1	NP	[8]20,000	[19]	34,000		NS	NS	Table[37], Formula[21]	X								28,000	42,000	48,000	62,000	80,000	80,000	49
50	Wyoming	[31]96	14-0	60	60	NR	85	85	1	1	2	20,000		36,000		NS	NS	Table	X							[14]80,000	28,000	44,000	48,000	64,000	80,000	[14]80,000	50
51	District of Columbia	96	13-6	40	40	NS	55	55	1	1	NP	21,000	22,000	37,000	38,000	NS	NS	Table-tire cap.	X						72,280	72,280	30,000	46,000	52,000	66,000	73,280	73,280	51
52	Puerto Rico	96	13-6	35	40	NS	50	50	1	1	NP	NS		NS		NS	NS	Spec. lim. tire cap.															52
53	New Brunswick																																53
54	Northwest Territories	120	13-6	40	40	NS	65	65	1	1	NP	20,000		[54]38,000		NS	NS	Axle lim.	X		35,000	50,000	55,000	70,000	85,000	110,000	28,000	46,000	48,000	66,000	84,000	110,000	54
55	Nova Scotia	102	13-6	40	40	45	65	65	2	2	2	20,000	21,000	35,000	37,000	NS	NS	Spec. max.	X		[41]30,000	[41]45,000	[41]50,000	[41]65,000	80,000	110,000	28,000	43,000	48,000	63,000	78,000	110,000	55
56	Ontario	102 3/8	13-7 3/8	36'1"	41'	45'-11"	68'-10"	68'-10"	NR	NR	NR	22,000	22,000	42,100	42,100	NS	NS	Table	X		44,800	61,900				140,000	30,000	50,100	52,000	72,100	92,100	134,300	56
	AASHTO Policy-1974	[22]102	13-6	40	40	40	55	65	1	1	2	20,000	20,000	34,000	34,000	95	400	Table	X								28,000	42,000	48,000	62,000	76,000	86,500	
Number of States	Higher	1	6	9	11	48	27	6	12	18	14	14		21				Formula 11									17	22	15	20	19	8	
	Same	9	45	31	39	2	24	21	38	31	20	27		23				Table 30	29								24	19	24	21	17	0	
	Lower	42	1	12	2	2	1	25	0	3	18	11		8				Spec. lim. 13									10	10	12	10	15	45	

NP—Not permitted. NR—Not restricted. NS—Not specified.

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[1] Various exceptions for farm and construction equipment; public utility vehicles, house trailers; buses; agricultural and forest products; at wheels of vehicles for safety accessories, on designated highways, and as administratively authorized.

[2] Various exceptions for utility vehicles and loads, house trailers, mobile homes and urban, suburban and school buses, auto and boat transporters.

[3] When not specified, limited to number possible in practical combinations within permitted length limits; various exceptions for farm tractors, mobile homes, etc.

[4] Legally specified or established by administrative regulation. Subject to axle limits.

[5] Computed under the following conditions to permit comparison on a uniform basis between States with different types of regulation:

A. Front axle load of 8,000 pounds.

B. Maximum practical wheelbase within applicable length limits:

(1) Minimum front overhang of 3 feet; minimum spacing from first to second axle of truck tractor 8 feet.

(2) In the case of a 4-axle truck-tractor semitrailer, rear overhang computed as necessary to distribute the maximum possible uniform load on the maximum permitted length of semitrailer to the single drive-axle of the tractor and to the tandem axles of the semi-trailer, within the permitted load limits of each.

(3) In the case of a combination having 5 or more axles, minimum possible combined front and rear overhang assumed to be 5 feet, with maximum practical load on maximum permitted length of semitrailer, subject to control of loading on axle groups on total wheelbase as applicable.

C. Including statutory enforcement tolerance as applicable.

[6] Less than three axles 35 feet.

[7] Trailer 35 feet in New Jersey, 40 feet in Nebraska and Arizona. Semitrailer 45 feet in Illinois.

[8] Steering axle 12,000 pounds in Arkansas and Tennessee. In Wisconsin based on mfgr. tire ratings.

[9] Load on vehicle may exceed 13'6" but not exceed 14'0".

[10] 65' for agricultural products. Semitrailer limited to 45'.

[11] On class AA, or designated highways, 12 ft 6 in. on other highways.

[12] On Interstate system only. 101,000 lbs. on primary and secondary highways.

[13] Steering axle-12,500 pounds (some exemptions) 20,500 any axle of a bus.

[14] Lower limits apply on Interstate System.

[15] Except when the vehicle or combination is equipped with a tridum axle the practical maximum would be 88,000 pounds on non-interstate and 83,400 pounds on interstate highways.

[16] 80,000 pounds maximum, except on public roads under Rural Roads Authority 56,000 pounds maximum unless making a pick-up or delivery. Vehicles in excess of 73,280 pounds up to the maximum of 80,000 pounds must qualify on any group of axles, based on the formula: $W = 500\left(\frac{LN}{N-1} + 12N + 36\right)$. Axles with adjustable height may not be counted.

[17] 800 (L plus 40) where L is distance between first and last axle of group or 2 or more consecutive axles of vehicle or combination except that 700 (L plus 40) governs where L is 13 feet or less; alternate load determination by table for vehicles of 3, 4 or 5 axles for L between 19 feet and 51 feet provided single axle load limited to 18,000 pounds or less; 900 (L plus 40), where L is distance between first and last axle of vehicle or combination on highways which have no structures with a span of 20 feet or more.

[18] Two consecutive sets of tandem axles may carry a gross load of 34,000 pounds each if the first and last axles of the consecutive sets are not less than 36 feet apart.

[19] Axle load 21,000 pounds on 2-axle trucks transporting milk from farm to market and 21,500 pounds on single axle, 37,000 pounds on two axles less than 7 feet apart, and 4000 pounds more on groups of 3 or more axles more than 9 feet apart than in Table for vehicles transporting peeled or unpeeled forest products cut crosswise but not over Interstate System.

[20] Special limits for vehicles hauling timber and form products, ores, concentrates and aggregates; single axle 18,900 pounds, tandem axle 37,800 pounds; vehicle with 3 axles permitted, 56,740 pounds at 13 foot axle spacing; 4 axles permitted 66,000 pounds maximum at 21 foot axle spacing, vehicle with 5 or more axles permitted 79,000 pounds maximum at 43 foot axle spacing.

[21] $W = 500\left(\frac{LN}{N-1} + 12N + 36\right)$ Gross weight may not exceed 80,000 pounds on Interstate. Except in Michigan, Montana and Hawaii.

[22] On designated highways only.

[23] On designated highways; 16,000 pounds on other highways.

[24] Truck tractor semitrailer drawing one trailer or tractor stinger-steered semitrailer or auto transport 65 feet. (On any 4 lane or other designated highway in Illinois; on designated highways in North Dakota).

[25] 34,500 on logging trucks.

[26] Auto and boat transports permitted 60 feet plus 5 feet overhang not to exceed 3 feet at either end. Three-unit combinations, vehicles hauling livestock or implements of husbandry permitted 60 feet.

[27] On state maintained highways; on other highways 11.5 feet high; trucks 26.5 feet and buses 30 feet long.

[28] None on Interstate.

[29] On state maintained highways; 30 feet on other highways.

[30] On four lane highways only.

[31] 102" on all roads over 20 feet in width except Interstate System.

[32] But not less than 30 net brake horsepower.

[33] Auto transports 13 feet 6 inches; other vehicles 13 feet 6 inches on designated routes.

[34] Double-deck bus - 14' 3"; Trailer coach - 14' 0".

[35] Less than 48-inch spacing, 36,000 pounds.

[36] Annual permit required. 1 axle 20,000 lbs. Tandem 34,000 lbs.

[37] On Class A highways. All axles of a vehicle or combination—80,000 pounds maximum. Wheel, axle, axle group and gross vehicle weights on Class B Highways are 60% of weights including tolerance authorized for Class A Highways.

[38] On designated highways only gross weight not to exceed $500\left(\frac{LN}{N-1} + 12N + 36\right)$ except that two consecutive sets of tandem axles may carry a gross load of 34,000 lbs. each if the first and last axles of the consecutive sets of tandem axles are not less than 36 feet apart and the gross vehicle weight does not exceed 80,000 lbs.

[39] Drive away, towaway operations may include a combination of saddlemount vehicles not to exceed 3 units in contact with the highway.

[40] Limitation does not apply to a semitrailer being towed by truck tractor providing the distance between the kingpin and the rearmost axle does not exceed 38 feet. The semitrailer, exclusive of attachments, shall not extend forward of the rear of the truck cab.

[41] Specified maximum can be exceeded dependent on front axle design capacity.

[42] Or as prescribed by P.U.C.

[43] Five axle units having 51 feet or more of wheelbase may gross 80,000 lbs. not to exceed the specified axle loadings of 20,000 and 34,000 lbs.

[44] 24,000 pounds if 4 feet or less apart 34,000 pounds plus 500 pounds for each full 6 inch increment over 4 feet, and not more than 10 feet apart, maximum weight not to exceed 40,000 pounds.

[45] Combinations over 75 feet operating on designated routes required 1 net bhp per 400 lbs.

[46] Increased weights up to 36,000 lbs. (max. 18,000 per axle) for two axle; 58,400 lbs. for three axle truck-tractor semi-trailer; and 73,000 lbs for four axle vehicles when the distance between the first and last axle is not less than 28 feet.

[47] Weight shown plus front steering axle of not to exceed 18,000 pounds.

[48] Self-compacting garbage or refuse hauling trucks 22,000 pounds single axle; 40,000 pounds tandem axle, gross weight not more than 54,000 pounds on a 3-axle truck, except on Interstate.

[49] Self compacting garbage or refuse truck 22,000 lbs. except on Interstate

[50] Axles spaced less than 6 feet 32,000 pounds; less than 12 feet 36,000 pounds; 12 feet or more governed by axle limit.

[51] Single vehicle with 3 or more axles spaced less than 16 feet 40,000 pounds; less than 20 feet 44,000 pounds; 20 feet or more governed by axle limit.

[52] Tractor semitrailer with 3 or more axles spaced less than 22 feet 48,000 pounds; less than 27 feet 50,000 pounds; 27 feet or more governed by axle limit.

[53] Axle spacing 27 feet or more.

[54] Minimum distance from center to center of wheels is 10 feet.

[55] 65 feet for other combinations on State primary, Interstate or other designated routes plus five miles therefrom. Auto transports allowed 3' front and 4' rear overhang.

[56] Limited to 3,500 pounds.

[57] Three axle truck 55,000 pounds with no restriction on tandem. On Interstate 22,400 pounds single, 36,000 pounds tandem.

[58] For other than Interstate W=800 (L+40)

[59] 38,000 plus 900 L but not greater than 80,000 where L is the distance in feet from front to rearmost axle.

[60] For weights in excess of 73,280 lbs. on the Interstate system $W=500\left(\frac{LN}{N-1} + 12N+36\right)$ not to exceed 80,000 lbs.

[61] $W=500\left(\frac{LN}{N-1} + 12N+36\right)$. Gross weight may not exceed 79,800 lbs. Applies to 5 or more axles only.

[62] Combination limited to 55' if semitrailer is over 45'.

[63] Mobile home 14'

[64] Self compacting garbage and refuse trucks 24,000 pounds on single axle, 42,000 pounds on tandem axle, except on Interstate.

[65] 20,000 pound single axle and 34,000 pound tandem axle for buses.

[66] Except when the vehicle or combination is equipped with a tridum axle the specified maximum gross vehicle weight is 88,000 lbs. for non-interstate and 83,400 pounds for interstate highways. Maximum load for a tridum axle is 42,000 pounds.

[67] Truck-tractor/stinger steered semitrailer combination length of 75 feet allowed if kingpin or other coupling device is located to the rear of the last axle of the towing vehicle.

EXHIBIT 523

HIGHWAY MILES SHOWING ASPHALT AND CONCRETE WITHIN THE STATE OF IOWA

INTERSTATE (not including ramps)

CONCRETE		593.63 (81.51%)
ASPHALT ON CONCRETE	66.55(9.14%)	0.08 on 400′ on I-29 9.92 on I-35 58.10 on I-80
ASPHALT	68.10(9.35%)	25.60 on I-29 24.95 on I-35 0.11 on I-235 16.89 on I-80

TOTAL INTERSTATE MILES—728.28 MILES

PRIMARY

CONCRETE	3748.45	(40.71%)
ASPHALT	5459.22	(59.29%)

TOTAL PRIMARY MILES—9207.67 MILES

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EXHIBIT 524

Menlo Park California

July 20, 1978

RON BURBANK—Bldg.

cc: L. Scott

Attached is the information you requested pertaining to Senator Kennedy's proposal to trailer length plus 15 feet:

1. ATA publication entitled "The Case for Twin Trainers", dated September 1977. This publication contains much of the information you requested.
2. CF accident frequency comparison for twin trailers versus semi trailers for 1970 through 1977.
3. 1973 accident comparison of twin trailers versus semi trailers by four other carriers.
4. Turning and tracking sketches.
5. List of influential people who spoke out for twin trailers in recent Wisconsin lawsuit.
6. General comments.

John J. Killilee
Director of Safety

JJK:1z

Attachments

Below is a comparison of Twin Trailer Accident Frequencies versus Tractor Semi-Trailer Accident Frequencies. It is based on "Reportable Accidents" as defined in Part 394 FMCSR.

In 1973 the criteria for reporting changed. The dollar amount went from $250 per accident to $2,000. That explains the change in frequency. 1973 has been figured both ways. Also at about that time the frequency for Doubles started to show a poorer performance than that for Semis. The reason may be two-fold based upon the value of the property exposed: (1) four units in a twin trailer combination vs. two in a tractor-semi combination; and (2) more LTL freight can be hauled in a twin trailer than in a tractor-semi. As a result of this greater exposure, property damage in a twin trailer accident may exceed $2,000 when a comparable accident with a tractor-semi may not exceed this amount.

	TWIN TRAILER			TRACTOR-SEMI		
	MILES	ACCIDENT FREQUENCY	MILES PER ACCIDENT	MILES	ACCIDENT FREQUENCY	MILES PER ACCIDENT
1970	135,483,791	2.62	381,644	76,311,479	3.57	279,529
1971	163,011,722	2.69	371,325	66,922,450	2.98	334,612
1972	189,095,668	2.66	375,936	64,844,952	3.73	267,954
1973	211,888,593	2.50	399,037	67,359,788	3.14	317,735
1973	211,888,593	.85	1,177,158	67,359,788	.94	1,069,202
1974	234,133,413	.89	1,125,641	59,280,178	.62	1,602,166
1975	204,947,759	.81	1,242,107	66,941,570	.52	1,912,616
1976	216,994,970	.76	1,315,121	83,408,545	.50	1,985,917
1977	230,557,995	.87	1,152,790	105,550,168	.68	1,465,975

LYONS TRANSPORTATION LINES, INC.
138 East 26th Street, Erie, Pennsylvania 16512
Phone: 814/456-8551

January 30, 1973

TO WHOM IT MAY CONCERN:

Listed below is a comparison of total highway vehicle accidents to total highway miles traveled by Lyons Transportation Lines, Inc. in the State of Ohio. This report covers an aggregate of five years; 1968, 1969, 1970, 1971 and 1972. It is separated by accidents involving 65 ft. tractor-twin trailer combination units and 55 ft. tractor-full trailer combination units.*

I. Highway Vehicle Accidents (1968 thru 1972):

Total Highway Miles	Total Highway Accidents	Accident Frequency Rate**
17,967,602	26	1.44

II. Highway Vehicle Accidents (1968 thru 1972)
65 Ft. Tractor-Twin Trailer Combination Units:

Highway Miles	Highway Accidents	Accident Frequency Rate**
3,580,760	1	.27

III. Highway Vehicle Accidents (1968 thru 1972)
55 Ft. Tractor-Full Trailer Combination Units:

Highway Miles	Highway Accidents	Accident Frequency Rate**
14,386,842	25	1.75

NOTE: * Statistics are based on the Department of Transportation required accident reports (fatality, injury or property damage of $250).

** Accident frequency rate—

$$\frac{\text{Number of Accidents x 1,000,000 Miles}}{\text{Vehicle Miles}}$$

In five years including 12,480 and 3,580,760 miles traveled, Lyons has not had one accident that can be attributed to the vehicle being a twin trailer configuration unit.

Other studies also indicate that twin trailer configurations do have fewer accidents than do conventional ones. This is affirmed by a survey made by the Ohio Trucking Association.

Very truly yours,

LYONS TRANSPORTATION LINES, INC.

/s/ G. E. Stanley,
G. E. STANLEY, Director
Safety, Insurance & Claims

PACIFIC INTERMOUNTAIN EXPRESS CO.
Post Office Box 958, Oakland, California 94604

January 22, 1973

Mr. James Runk
Pennsylvania Motor Trucking Association
7th Floor, Telegraph Building
Harrisburg, PA 17101

Dear Mr. Runk:

Willard Johnson of P-I-E asked me to send you the most up-to-date information I have on comparative accident rates of doubles equipment and three axle tractors. Because of an interruption in our way of keeping mileage during 1969 and 1970, I have to give you three different comparisons. However, they all show the doubles involved in far fewer accidents, when mileage is considered.

Equipment	Miles	Accidents Per Million Miles	Miles Per Accident
January 1965 through December 1968			
Doubles	219,709,068	2.99	333,928
Tractor-Semi	184,621,060	3.78	264,870
Year 1971			
Doubles	97,037,080	2.32	431,276
Tractor-Semi	15,490,032	4.85	206,534
First Eight Months 1972			
Doubles	65,865,164	2.54	394,402
Tractor-Semi	7,867,547	3.43	291,390

Except for the 1972 figures, all the statistics shown above have been distributed to a number of State Trucking Associations interested in promoting doubles.

Very truly yours,

Frank M. Williams
Manager of Corporate Safety
FMW:em

cc: W.A. Johnson-Bldg.

IML FREIGHT, INC.

SYSTEMWIDE SAFETY RECORD IN ACCIDENTS PER MILLION MILES SINGLE TRAILER VERSUS TWIN (DOUBLES) TRAILER OPERATION

Year	Total System Miles	Total System Accidents	Average System Accident Frequency	Single Trailer		Twin Trailer		Twin Trailer Percent of Total Fleet (Sets)
				Accidents	Frequency	Accidents	Frequency	
1966	46,507,804	98	2.10	90	2.61	8	.66	26%
1967	50,666,932	100	1.97	81	2.16	19	1.44	26%
1968	56,194,960	94	1.67	73	1.86	21	1.25	30%
1969	62,193,936	59	.95	41	1.12	18	.71	41%
1970	65,580,084	88	1.34	54	1.65	34	1.03	50%
1971	74,727,668	124	1.66	72	2.19	52	1.24	56%
1972	81,223,841	166	2.04	108	3.32	58	1.19	60%

LEE WAY MOTOR FREIGHT, INC.
General Office
3000 West, Reno
Post Office Box 82488
Oklahoma City, Oklahoma 73108

January 31, 1973

Mr. Curtis S. Crowe
Consolidated Freightways
175 Linfield Drive
Menlo Park, California 94025

Dear Mr. Crowe:

In re Twin Trailer Legislation in Pennsylvania
I make reference to your letter dated January 19, 1973, addressed to M. S. Lee.

An analysis of our highway accident record involving doubles (twin trailers) versus single van (40 and 45 foot) for the years 1969 through 1972 is as follows:

1969	Mileage	Class	No. Accidents	Frequency
	18,957,224	Doubles	52	2.74
	40,284,100	Singles	284	7.05
	69,241,324		336	4.85
1970				
	15,832,358	Doubles	42	2.65
	40,711,776	Singles	172	4.22
	66,544,134		214	3.21
1971				
	19,852,960	Doubles	57	2.87
	51,050,467	Singles	195	3.82
	70,903,427		252	3.55
1972				
	31,718,839	Doubles	76	2.40
	47,578,259	Singles	198	4.16
	79,297,098		274	3.45

EXHIBIT 538

THE EFFECT OF VEHICLE LENGTH ON POTENTIAL FOR COLLISION

Report to
General Counsel Division
Iowa Department of Transportation

by
R. L. Carstens
Professor of Civil Engineering
Iowa State University

Engineering Research Institute
Iowa State University
Ames, Iowa

April, 1979

THE EFFECT OF VEHICLE LENGTH ON POTENTIAL FOR COLLISION

Many of the causal factors of collisions involving large combination vehicles are relatively independent of vehicle length. An exception occurs when another vehicle impacts the side of the tractor or trailer of a combination vehicle at a right angle. The exposure time, and consequently the probability of a conflict, bears a direct relationship to vehicle length when a combination vehicle crosses a traffic stream at approximately a right angle.

A study conducted by the Highway Safety Research Institute, University of Michigan, investigated the frequency of occurrence of such accidents in Michigan in the period 1972 through 1976 and Texas for 1975 and 1976.[1] Eighty-seven fatal crashes resulted from angle impacts of a car with a truck-tractor or trailer. This represented 10.3 percent of the car-truck fatal crashes during the period studied.

Study Design

In order to quantify the exposure of vehicles to right-angle collisions, a study was undertaken to determine some of the characteristics of large-vehicle maneuvers in crossing the paths of moving vehicles at approximately right angles. Study sites included several intersection and driveway locations in the metropolitan areas of Des Moines and Minneapolis-St. Paul. In each case, the intersection was with a four-lane highway at a location not controlled by a traffic signal.

Field survey data utilized for the analysis used in this report were collected at the intersections of the four ramp terminals at the interchange of I-80 and I-35 with Second Avenue north of Des Moines. The ramps terminate at this interchange on frontage roads with two-way traffic so that a variety of turning and straight-through movements is possible.

Second Avenue at this location is a divided four-lane highway with protected left-turn bays at the intersections with frontage roads. Each maneuver that was studied involved crossings, at approximately right angles, of two lanes used for through traffic movements. Three specific types of maneuvers were identified, as follows:

- Type I—straight through from frontage road to frontage road.
- Type II—left turn from Second Avenue to frontage road.
- Type III—left turn from frontage road to Second Avenue.

The study reported herein included a determination of the times that combination vehicles encroached upon the 24-ft width of two traffic lanes. In each case, movement of the combination vehicle was initiated from a stop. For movements from a frontage road, the time was taken for crossing the two lanes closest to the stopped position. For movements from Second Avenue, the time was taken for crossing the two lanes in the opposing direction, relative to the initial direction of the combination vehicle. All crossing paths were at approximately right angles with the traffic lanes for which encroachment times were determined.

All combination vehicles were assumed to be 55 ft in length. Most vehicles were 3-S2 combinations although a few were 2-S2 configuration. There were no double-bottom vehicles encountered at this location.

The path of a straight-through vehicle was assumed to include 79 ft of travel while encroaching upon the traveled lanes, 24 ft of roadway width plus the 55 ft vehicle length. Comparable encroachment travel distance were 81 ft for left turns onto Second Avenue and 82 ft for left turns from Second Avenue. The paths for turning vehicles are slightly curved.

In each case, some travel took place in moving from a stopped position to the point where encroachment of the traveled lanes began. Average distances of 10 ft were used for travel from frontage roads and 33 ft for the route to clear the median and turn onto a frontage road. These values are summarized in Table 2 using the notation displayed in Table 1. Results of the field study are summarized in Table 3.

Table 1. Notation used in Tables 1 through 4

Symbol	Quantity
d_0	Distance traveled prior to encroachment on traveled lanes, ft
d	Distance traveled during encroachment on traveled lanes, ft
D	Distance traveled from stop until encroachment ends, $d_0 + d$, ft
n	Number of observations in sample
t	Mean observed time of encroachment, sec
s	Standard deviation of observed time of encroachment, sec
t_{10}	10th percentile observed time of encroachment, sec
t_{50}	50th percentile (median) observed time of encroachment, sec
t_{90}	90th percentile observed time of encroachment, sec
a	Average rate of acceleration, ft/sec ^{2}
T_{60}	Calculated time of encroachment for a 60-ft vehicle, sec
T_{65}	Calculated time of encroachment for a 65-ft vehicle, sec

Table 2. Relevant distances

Type of movement	d_0 ft	d ft	D ft
I	10	79	89
II	33	82	115
III	10	81	91

Table 3. Field survey data

Type of movement	n	t sec	s sec	t_{10} sec	t_{50} sec	t_{90} sec
I	27	11.94	6.55	6.0	10.9	15.0
II	44	7.40	2.14	5.0	7.0	10.0
III	62	14.19	6.05	8.0	13.0	22.0

Analysis

Average acceleration rates were calculated for the observed median time of encroachment as well as for the 10th and 90th percentile values. Actual acceleration rates varied widely as these were modified by factors other than the acceleration capability of the vehicle. In many cases, trucks accelerated rather slowly as drivers regulated their speeds so as to fit their vehicles into gaps in conflicting traffic streams. Many such gaps were induced by forcing conflicting vehicles to change lanes, slow, or stop. Average rates of acceleration are displayed in Table 4.

Using the same average rates of acceleration, times may calculated for the encroachment of 60-ft and 65-ft vehicles on the same two traveled lanes. These values also are shown in Table 4.

Table 4. Average acceleration rates and encroachment times

Type of movement	Encroachment time for 55-ft vehicle, sec	a ft/sec ^{2}	T_{60} sec	T_{65} sec
I	6.0	2.19	6.25	6.49
	10.9	0.66	11.35	11.79
	15.0	0.35	15.63	16.24
II	5.0	1.98	5.23	5.46
	7.0	1.01	7.32	7.64
	10.0	0.50	10.46	10.91
III	8.0	1.27	8.32	8.64
	13.0	0.48	13.52	14.04
	22.0	0.17	22.89	23.76

A final calculation, summarized in Table 5, considered the change in the number of conflicts that would result from an increase in vehicle length from 60 ft to 65 ft. For this calculation, conflicting traffic was assumed to arrive randomly as described by a Poisson probability distribution.

Various traffic volumes are shown in Table 5 for the conflicting traffic stream. Note that the conflicting volume includes the flow in all lanes for which it is necessary to seek a suitable gap in order to complete a given maneuver. For each volume, the probability of occurrence of a gap sufficiently long to accommodate a 60-ft vehicle was calculated. A similar determination was made for a 65-ft vehicle. The reduction in frequency of occurrence describes the increase in probability that a conflict with other traffic will result from a given maneuver.

Data for the other locations surveyed were generally similar to those reported for the intersections of Second Avenue and the ramp terminals from I-80 and I-35. Only two double-bottom vehicles were encountered, both at the intersection of Guthrie Avenue and Dixon Street in Des Moines. Both vehicles turned left from Dixon with no conflicting traffic. The average encroachment time was 10.75 sec. Given their 60-ft length, this indicates an average rate of acceleration of 0.76 ft/sec^2, suggesting that the acceleration characteristics of double-bottom vehicles are within the range of values for those of the combination vehicles in the study sample.

Conclusions

It may be noted in Table 5 that the increase in conflicts resulting from an increase in length from 60 ft to 65 ft ranges from two percent (at very low conflicting volumes) to 25 percent (at relatively high conflicting volumes) for median rates of acceleration. At lower rates of acceleration, potential conflicts increase by up

Table 5. Change in probability of a suitable gap for increase in length from 60 ft to 65 ft

Type of movement	Encroachment time for 55-ft vehicle, sec	Decreased probability of suitable gap, percent				
		Conflicting flow, vehicles/hr				
		250	500	1000	1500	2000
I	6.0	2	3	6	10	12
	10.9	3	6	12	17	22
	15.0	4	8	16	22	29
II	5.0	2	3	6	9	12
	7.0	2	4	9	12	16
	10.0	3	6	12	17	22
III	8.0	2	4	9	12	16
	13.0	4	7	13	19	25
	22.0	6	11	21	30	38

to 38 percent. The significant increases in conflicts resulting from the increased length would, in turn, be expected to lead to an increase frequency of right-angle collisions involving side impacts with combination vehicles.

Reference

(1) Minahan, Daniel J. and James O'Day. "Car-Truck Fatal Accidents in Michigan and Texas," Report UM-HSRI-77-49, Ann Arbor: University of Michigan, Highway Safety Research Institute, October, 1977.

EXHIBIT 542

Comments on the Pierson Study:

Safety Comparison of Doubles vs. Tractor-Semitrailor Operations for Seven Major Motor Carriers

The data presented in this report does not provide a sufficient basis to reach a meaningful conclusion about the relative safety of the two types of trucks. Therefore, the title of the report is misleading. Several major deficiencies in the data and its previous analysis are outlined below.

A. Possible Sources of Bias. The study made no attempt to control the possible sources of bias. Even when the accident rates appear to be different for the two types of trucks, there is no way to determine from these data whether the difference is attributable to a difference in the inherent safety for the two types of trucks or to a combination of other factors. Some factors that may have a substantial influence on accident rates are listed below.

1. The amount of mileage covered by each type of truck on various types of highways. Data presented in the *Interstate System Accident Research Study* by Fee, et. al., carried out by the Office of Research and Development, Traffic Systems Divisions of the U.S. Department of Transportation, indicates that accident rates (for all types of vehicles) are reduced by at least 50% when a 2-lane rural highway is replaced by an interstate highway with at least 4 lanes.

2. The same study also indicated that the average daily traffic volume and the number of intersections per mile may also a substantial effect on accident rates. The accident rate tends to increase as the number of intersections per mile increases, but the relationship be-

tween accident rates and the average daily traffic volume seems to be curvilinear, declining at first but then increasing and gradually leveling off as the average daily traffic volume increases.

3. Another study carried out by the same organization, entitled *Analysis and Modeling of Relationships between Accidents* by Cirillo, et. al. (1969), indicates the such factors as width of lanes, stopping sight distance, type of road surface, and width of the right shoulder and whether or not the right shoulder is paved can all have sizeable effects on accident rates.

4. The effect on accident rates of the experience, training, ability, and attitudes of the drivers has been examined in the book *Accident Proneness* by Shaw and Sichel (1971, Pergamon Press). Various studies presented in this book indicate these factors have a non-negligible effect on accident rates.

5. Other factors that may also be important are truck maintainance policies, relative ages of the types of trucks, different lengths of various double trailer combinations, other company policies, relative amount of mileage covered in daylight hours and non-daylight hours, etc. . .

No attempt was made in the Pierson to control for the possible effects of these additional factors either by carrying out a controlled experiment based on the proper randomization techniques or by gathering information on the additional factors and then trying to adjust for the effects of these additional factors. Therefore it is not possible to use the data in the Pierson study to make a meaningful comparison of the inherent safety for the two types of trucks considered. It is impossible to separate the effect on the accident rates of the inherent safety of the two types of trucks from the effects of the other factors listed above. For example, doubles could actually be less safe than tractor-semitrailor trucks but the accident rates for doubles could be lower in the sample because doubles are driven by the best drivers more often on the safest types of roads and at slower speeds. On the other hand, the doubles could actually be as safe as the tractor-semis, but there is no way to make a meaningful determination from the data presented in the Pierson report.

B. *The Probability Model.* It is not entirely clear that the Poisson model is correct in this situation. No tests were carried out to determine if the Poisson model is adequate. When individual drivers vary in their ability the negative binomial model developed by Yule and Greenwood (1919-1920) has often been shown to be better than the Poisson model. Recently the study of accident rates has incorporated the methods of multiple regression based on an approximate normal model. These models can sometimes work well if the proper care is exercised in their use. The logistic model, which allows the mean of the Poisson variable (number of accidents, say) to be a function of several factors such as those listed in part A, has also been considered. The logistic model and the multiple regression model both allow one to adjust accident rates to control for the effects of extraneous factors. Models for accident data have been discussed in *Road Research, Proceedings of the Symposium on the Use of Statistical Methods in the Analysis of Road Accidents,* held at the Road Research Laboratory, Crowthorne, U.K. on 14-16 April 1969. This was an international conference with at least 18 nations represented. Some of the major conclusions of the chairmen for this symposium were that not enough work has been done in verifying the adequacy of the models used, and that there is a lack of complete and extensive data available to carry out this assessment. Data available from designed experiments is almost non-existant.

It is not clear which model is appropriate here. Certainly the determination of an adequate model cannot be made just from the summary statistics presented in the Pierson report. One needs to more closely examine the original data. However this criticism is not very important if the problems raised in part A cannot be resolved. Even if one could determine the distribution of accidents as Poisson, say, a safety comparison cannot be made until the effects of the extraneous factors road type, driver type, etc., have been deleted from the sample data.

C. *Differences in Accident Rates Among Individual Companies.* The data suggest the accident rates for doubles vary widely among individual companies. The accident rates for tractor-semis also vary widely among companies. Indeed, at least one company had lower sample accident rate for tractor-semis each year, and at least one company had a lower rate for doubles each year. This suggests that one should not sum across companies and present just that summary table.

Furthermore, the figures for the number of vehicles and the number of miles change drastically between 1973 and 1974. This suggests that the letter labels for the companies changed in 1974 and also possibly the method of sampling from company records. Consolidated Freightways has been determined to be company E for the 1969-1973 period, but they did not provide information in the 1974-1976 period.

The fact that accident rates varied from one company to the next leads to the question of how these companies were selected to be in the study. If the companies were not randomly selected, the accident rates computed from the sample could be highly biased estimates. This would be another reason why a meaningful safety comparison could not be made based on the summary statistics presented in Pierson's report.

To summarize, the data presented in the Pierson report does not contain sufficient information to make a meaningful safety comparison.

The data presented by the defendents in Table Y, is subject to the same criticisms raised in parts A and B in the comments on the Pierson report. These data also do not contain a sufficient amount of information to make a meaningful safety comparison for the two types of trucks. It is interesting to note that the accident rate for semis fell most drastically in 1974-1975 when lower speed limits were begun to be rigorously enforced. The accident rate for semis was observed to be smaller for semis from 1975-1977 and the rates have been rising again since 1975. This suggests that the average speeds the trucks are operated at has an effect on the accident rate (or this effect may also reflect the speed of the other vehicles on the road), and clearly one must remove the effect of this speed factor before a meaningful safety comparison can be made.

EXHIBIT 546

COMMENTS ON ROAD ACCIDENT REPORTED BY CONSOLIDATED FREIGHTWAYS IN 1978

by
Kenneth Koehler

April 1979

The following charts and tables summarize part of the information provided by Consolidated Freightways on their 'road' accident experience in 1978. The 'city' accidents are not included. The total mileage for double trailor trucks was reported to be 239,884,377 miles, and the total mileage for tractor-semitrailor trucks was reported to be 153,658,250 miles.

Consolidated Freightways classified their vehicles into eighteen equipment types in their computer records. In charts 1 and 2, the label 'Double' refers only to category 09 on the CF computer records, and the category 'Tractor-semi' refers to the combined set of categories 12, 07, and 06 on the CF computer records. Accident rates per 100 million vehicle miles are computed in Charts 1 and 2 by dividing the number of accidents for the 'Doubles' category by 2.39884377, and dividing the number of accidents for the 'Tractor-semi' category by 1.53658250.

For each chart a measure of the significance of the difference between the accident rates for doubles and tractor-semitrailors is computed. This measure is based on the conditional test for the difference in rates for two independent Poisson distributions and is defined by the following formula.

$$Z = \frac{(Y M_X) - (X M_Y)}{\sqrt{(X+Y) M_X M_Y}}$$

where X = the number of accidents for double trucks
Y = the number of tractor-semitrailer accidents
M_x = 239,884,377 miles
M_y = 153,658,250 miles

A negative value for z indicates that the observed accident rate for the doubles is smaller than the observed accident rate for the tractor-semitrailors. A p-value was computed to describe the statistical significance of each difference. Small p-values indicate significant differences. A p-value smaller than 0.01 was considered significant in this case. Therefore, the doubles were observed to have significantly higher rates for accidents involving upset trailors and accidents involving jackknifes for the 1978 road accident data reported by Consolidated Freightways.

Table 1 contains the numbers of accidents and the accident rates computed from the information supplied by Consolidated Freightways for their road accidents in 1978. This table shows the numbers of accidents reported according to four different sets of criteria. It shows how the number of accidents and the resulting accident rates for one year may differ when different sets of criteria are used to determine when an accident should be reported. Therefore, when comparing two sets of accident data, one must be careful and determine if similar criteria were used to determine which accidents were included in each set of data.

In Table 1 the 'Doubles' category consists of Consolidated Freightways categories 09 and 14. For both of these categories a tractor pulls a pair of trailors. Category 14 consists of trucks for which a tractor pulls one doubles trailor and one "short box". In Table 1 the tractor-semitrailor category consists of Consolidated Freightways categories 06, 07, and 12. Consolidated Freightways categories 05, 08, and 13 consist of trucks for which a tractor pulls just one doubles trailor or one doubles trailor and a dolly. In Table 1 these three categories were combined to form a 'broken down double' category. No mileage figures are currently available for this category, but it is evident from the table that the accident rates for the tractor-semitrailor category could be inflated by about 10% if the accidents for the broken down doubles are included in the tractor-semitrailor category. Since the broken down doubles are actually part of the doubles operation it is more reasonable to consider them as a separate group than to merge them with the tractor-semitrailors.

Table 1 shows that the accident rates for tractor-semitrailor trucks operated by CF were observed to be lower than the corresponding accident rates for the doubles operated by Consolidated Freightways in 1978. The graph in Figure 1, on the following page, shows that the accident rate has been observed to be lower for the tractor-semitrailors since 1975.

Note that if the accidents for the broken down doubles were included in the tractor-semitrailor category, then the accident rates for doubles and tractor-semitrailors would appear to be about equal for all road accidents, accidents reported to the National Safety Council, and preventable accidents. However, the accident rates for those accidents reported to the Department of Transportation would be

	Doubles	Tractor-semi and broken down doubles
Number of accidents	249	110
Accidents per 100 million miles	103.8	71.6

Computing the statistic defined on page 2, we obtain $z = -3.26$, which yields a p-value of 0.008. Therefore, these data indicate that the accident rate is significantly higher for doubles. As shown in Table 1, this difference would be even greater if the broken down doubles were excluded from the tractor-semitrailor category (however, to be fair the reader must be warned that the same total mileage that CF reported for the tractor-semitrailor category was used in the calculation above and in Table 1. If the mileage for the broken down doubles category could be obtained, appropriate adjustments could be made in calculating the accident rates, but these adjustments would most likely not the conclusion that the doubles have a higher accident rate.)

The graph in Figure 1 shows the yearly accident rates reported by Consolidated Freightways (in Table Y) on the broken and solid lines. These lines are broken between 1973 and 1974 because it appears that the criteria for including accidents changed between those two years. The graph in the lower lefthand corner was constructed from accident data CF reported in the Pierson BMCS study between 1970 and 1973. Note, again, how the accident rates can differ when different criteria are used to determine which accidents are reported.

Consolidated Freightways has claimed that the data represented by the broken and solid lines shows that accident rates for the doubles were significantly lower in 1970, 1972, and 1973. But one would not draw that conclusion from the data they reported in the BMCS study which is represented by the lower lines.

Table 1: ROAD ACCIDENTS REPORTED BY CONSOLIDATED FREIGHTWAYS IN 1978

A. All road accidents reported in 1978

	Doubles	Tractor-semi	Broken down doubles	Other
Number of accidents reported	724	419	45	29
Accidents per 100 million miles	301.8	272.7		

B. Accidents reported to the National Safety Council

	Doubles	Tractor-semi	Broken down doubles	Other
Number of accidents reported	638	352	38	24
Accidents per 100 million miles	266.0	229.1		

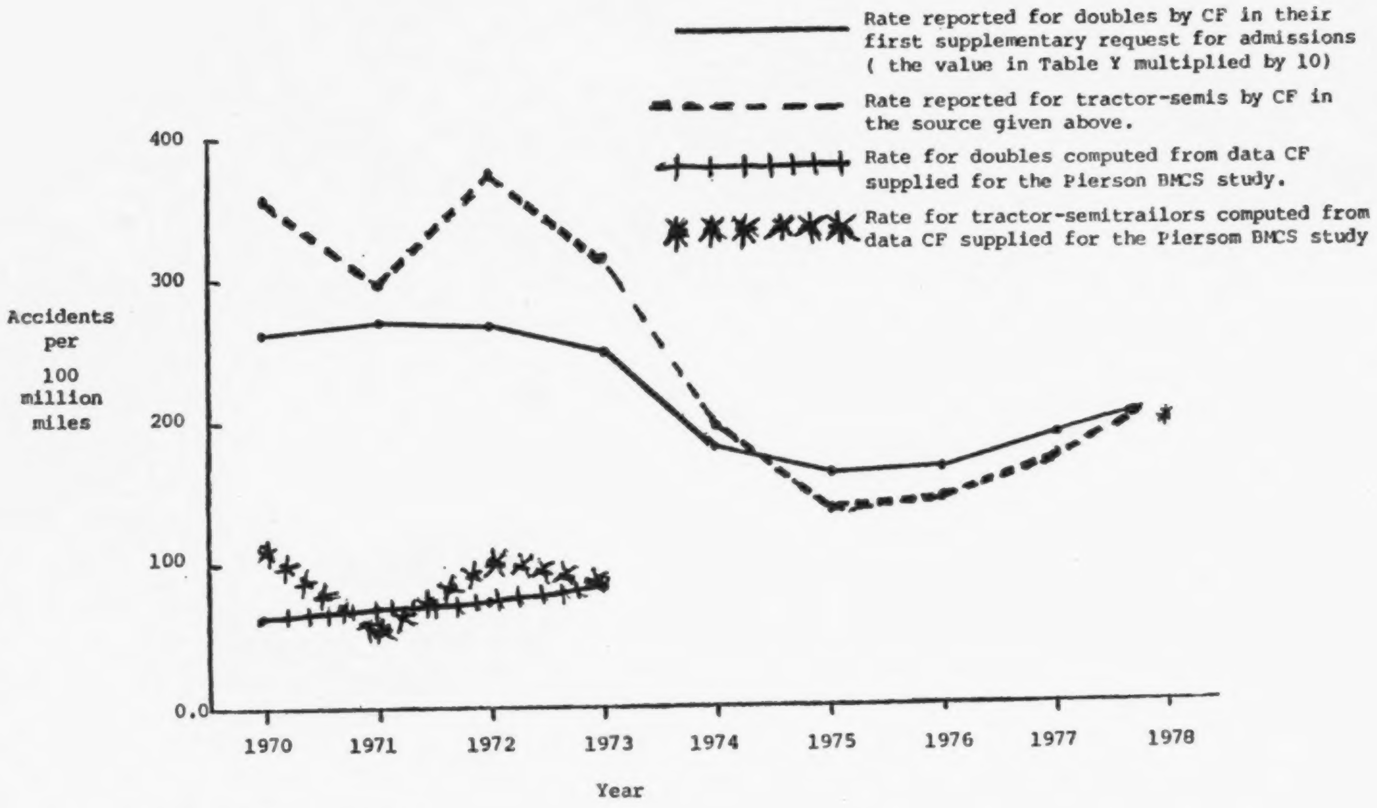
C. Accidents reported to the Department of Transportation

	Doubles	Tractor-semi	Broken down doubles	Other
Number of accidents reported	249	97	13	10
Accidents per 100 million miles	103.8	63.1		

D. Accidents classified as preventable by Consolidated Freightways

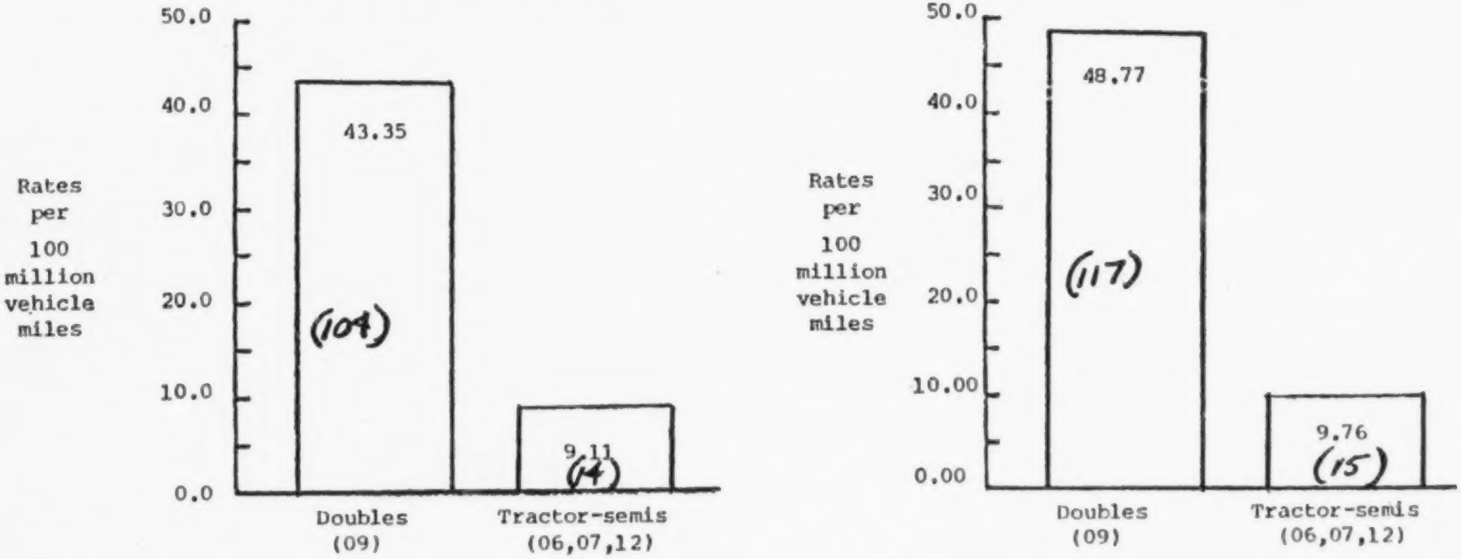
	Doubles	Tractor-semi	Broken down doubles	Other
Number of accidents reported	391	221	24	17
Accidents per 100 million miles	163.0	143.8		

Figure 1: Yearly accident rates for vehicles operated by Consolidated Feightways



* EXTENDED IN TESTIMONY

Chart 1: ACCIDENTS INVOLVING UPSET TRAILORS EXPERIENCED BY CONSOLIDATED FREIGHTWAYS FOR THEIR ROAD OPERATION IN 1978



Accidents Considered Preventable by Consolidated Freightways

Accidents reported to the National Safety Council

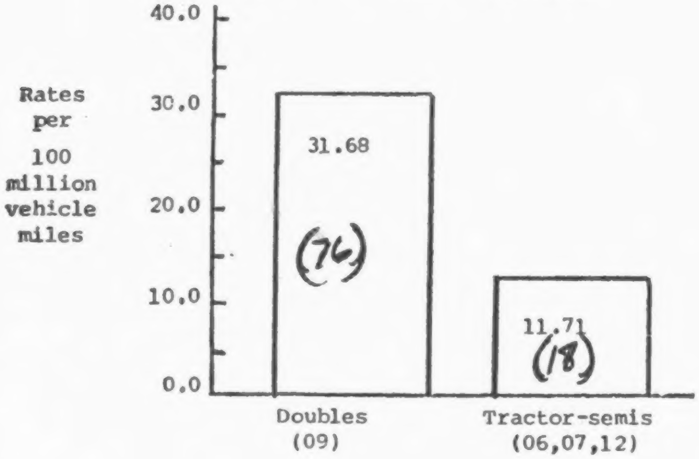
z = - 6.052, p-value < .0001

This difference is significant.

z = - 6.519, p-value < .0001

This difference is significant.

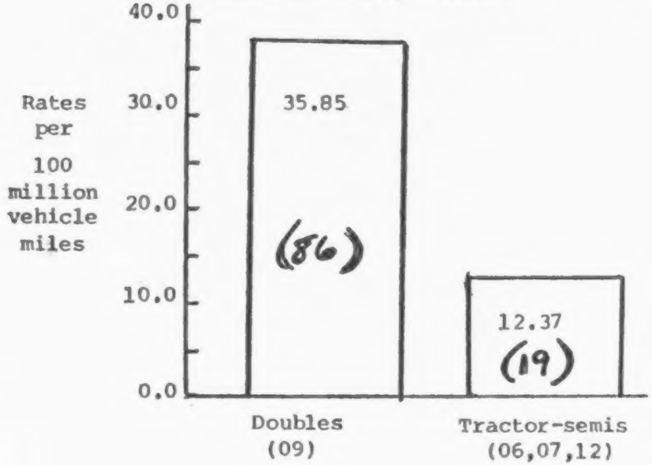
Chart 2: JACKKNIFE ACCIDENTS EXPERIENCED BY CONSOLIDATED FREIGHTWAYS FOR THEIR ROAD OPERATION IN 1978



Accidents considered preventable by Consolidated Freightways

Z = -3.95, p-value < .0001

This difference is significant.



Accidents reported to the National Safety Council

Z = -4.40, p-value < .0001

This difference is significant

EXHIBIT 543

ANALYSIS OF THE SUMMARY DATA FOR EACH YEAR

Assume accidents follow a Poisson distribution

The tests in the following three tables present the strongest case for double trailor safety in terms of rate comparisons. However, these rate comparisons reflect true differences only if both types of trucks are operated under similar conditions. There is no support in this report that this is in fact the case.

Note that this method seems to indicate that the accident rate and injury rate were significantly lower for double trailer trucks in all years except 1975. There was not enough information to obtain a significant result at the $\alpha = .05$ level for fatality rates.

It seems unreasonable that accident rates for double trailor trucks should actually be lower. This indicates that double trailor trucks are operated under different conditions than single trailor trucks and that these conditions are favorable to lower accident rates for double trailors. However, we have no measure of the size of this bias since the report gives no information on covariates such as percentage time operated on various road types, company policy, etc. Since the amount of bias is unknown one cannot use these data to conclude that either type of truck is more safe. The study is inconclusive.

EXHIBIT 548

POWER OF THE TEST FOR COMPARING ACCIDENT RATES

The test statistic used to test the hypothosis that the accident rates for two equal truck types is:

$$z = \frac{YM_X - XM_Y}{\sqrt{(X + Y)\ M_Y M_X}}$$

Using a 95% confidence level (or .05 significance level), the hypothesis of equal accident rates is declared to be false for a particular study if the observed value of z is larger than 1.96 or smaller than — 1.96. The symbols used in the formula are:

X	number of accidents for truck type 1
M_x	miles traveled by truck type 1
Y	number of accidents for truck type 2
M_y	number of miles traveled by truck type 2

When each vehicle type travels the same number of miles the formula for the test statistic z reduces to:

$$z = \frac{Y - {}^{t}/_{2}}{\sqrt{{}^{t}/_{4}}}$$

where $t = Y + X$ in the total number of accidents observed. It is only this case which is considered below.

The *power* of this test is the probability, or chance, that the test statistic indicates a significant difference in accident rates when the accident rates are actually *not* equal. The power is a function of three quantities:

1. The number of accidents observed (t).
2. The size of the actual difference in the accident rates for the two truck types.
3. The significance level used.

Table 1 presents the total number of accidents required to obtain certain power levels for several differences in accident rates for the two truck types. For the calculations in Table 1 a 95% confidence level (or .05 significance level) is assumed for the test. If a 99% confidence level (or .01 significance level) had been used, the sample sizes would be larger.

The differences in accident rates considered in Table 1 are given in percentages. For example, a 30% difference in accident rates occurs if the accident rate for truck type 1 is u_x and the accident rate for truck type 2 is $u_y = u_x + (0.3)\ u_x = (1.3)\ u_x$.

TABLE 1. TOTAL NUMBER OF ACCIDENTS REQUIRED TO ACHIEVE CERTAIN POWER LEVELS

		ACTUAL PERCENTAGE DIFFERENCE IN ACCIDENT RATES						
		5%	10%	20%	30%	50%	75%	100%
	.10	779	205	57	29			
Power (or the chance of detecting a difference)	.15	1424	375	104	51	23		
	.25	2773	728	200	98	43	24	
	.50	6458	1694	465	226	96	52	35
	.75	11,679	3063	839	406	172	92	61
	.90	17,642	4626	1267	613	259	137	91
	.99	30,869	8092	2213	1070	450	237	156
	.999	42,855	11,230	3070	1483	622	327	214

In the

SUPREME COURT of the UNITED STATES

October Term, 1979

No. 79-1320

RAYMOND KASSEL, et al.,

Appellants,

vs.

CONSOLIDATED FREIGHTWAYS CORPORATION
OF DELAWARE, A Delaware Corporation,

Appellee.

*On Appeal from the United States Court
of Appeals for the Eighth Circuit*

MOTION TO AFFIRM

John H. Lederer

JOHN DUNCAN VARDA
ANTHONY R. VARDA

DeWITT, SUNDBY,
HUGGETT & SCHUMACHER, S.C.
121 South Pinckney Street
Madison, Wisconsin 53703

Attorneys for Appellee

[illegible] PRINTING MADISON WIS

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MOTION TO AFFIRM

QUESTIONS PRESENTED

The following questions are those presented by the argument in Appellants' Jurisdictional Statement:

1. In determining whether a state regulation of vehicle size promotes safety, is the trial court's consideration limited to those aspects of safety denominated by the state, without inquiry as to their significance or as to other countervaling safety characteristics?

2. Was it error for the District Court to make findings of fact?

STATEMENT OF THE CASE

The 65-foot twin trailer is a standard vehicle for interstate transportation of general commodity freight.[1] Twins offer distinct operating advantages including more rapid and flexible service, reduction of cross-dock handling, reduced exposure of freight to damage or loss, improved fuel efficiency, and improved service to smaller towns.

General commodity carriers, such as Appellee, offer service throughout the country and serve many communities by interchanging equipment with other carriers. Thirty-four states permit the operation of 65-foot twin trailers. With the exception of Iowa, those states prohibiting 65-foot twins are located in the East or Southeast. Iowa is the only state with a 60-foot length limitation for twin trailers. The odd-sized trailer of the 60-foot twin cannot be interchanged.

As a result of Iowa's ban, East-West traffic that would normally cross Iowa via Interstate 80 is diverted through northern Missouri on U.S. 36, a predominantly two-lane highway. The ban forces North-South traffic to either be diverted or move in semis through Iowa. Traffic originating or terminating in Iowa, other than in border cities,[2] must be placed in semis or shuttled in single twin trailer-tractor combinations.

The ban results in delays, increased exposure of cargo to damage, and increased costs of operation. The unnecessary vehicle miles caused by the ban "... result in more accidents, more injuries, more fatalities and more fuel consumption, than would occur if the 65-foot twins were operated through Iowa over I-80 and I-35". Order of the Court Denying Stay Pending Appeal, August 20, 1979.

---

[1] As in the District Court's opinion, reference to twins or twin trailers will be to 65-foot twin trailers. Sixty-foot twin trailers will be so identified.

[2] Iowa permits the operation of 65-foot twin trailers in cities which border other states, thereby providing twin trailer service for shipments originating from or destined to many of Iowa's industrial areas. The actual exemption is for the city's "commercial zone", an area substantially larger than the city proper.

Iowa's Interstate Highways do not present a special case where limitation of traffic is necessary due to congestion or deterioration. The evidence at trial showed that the addition of 65-foot twins on the Interstate System in Iowa would have no discernable effect on the system's generally high level of service. Twin trailers cause substantially less road wear than semis because of advantageous axle spacing.

Extensive evidence showed the 65-foot twin trailer to be as safe or safer than the 60-foot twin trailer or 55-foot semi. Appellants virtually conceded the absence of any evidence that twin trailers are less safe vehicles than semis. Appellants' experts had no opinion as to their overall safety.

Appellants instead based their defense on three main arguments. First, they contended that the evidence on overall twin trailer safety was inconclusive. Second, they offered evidence on isolated safety characteristics as to which they argued twins to be deficient. They contended that if in any aspect a twin was less safe, the regulation must be upheld. Finally, Iowa asserted that even if twins' overall safety were as good as that of semis, Iowa could ban them to reduce traffic volume.

The District Court rejected each of Appellants' three contentions, specifically holding the evidence of 65-foot twin trailer safety to be conclusive. The Court evaluated all safety characteristics in reaching its conclusion. Iowa's diversion argument was rejected as a local purpose of little weight in the balancing process, since the diversion merely shifted interstate traffic to other states and magnified the number of accidents, injuries and fatalities associated with the traffic.

The Court of Appeals affirmed the District Court in each respect. It agreed that the proper test was the overall safety of the vehicle and found the trial court's conclusions on twin trailer safety to be well supported in the record. The argument that Iowa could properly divert traffic to other states to reduce its own accidents was also rejected by the Court of Appeals. The Court declared that a state could prohibit a vehicle which was unsafe, even if it were permitted by other states. However, the Court noted, where a state regulation promoted safety locally, not by prohibiting an unsafe vehicle but by diverting interstate traffic to other states, the regulation was entitled to little weight. The Court also pointed to Iowa's numerous size and weight exemptions as undercutting the state's safety claim, even though not directly discriminatory.

ARGUMENT

NO SUBSTANTIAL FEDERAL QUESTION IS PRESENTED.

A. Recent, Clear Precedent applies.

The test applied by this Court in commerce clause cases is that enunciated in *Pike v. Bruce Church:*

> "Where the statute regulates evenhandedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits. *Huron Cement Co. v. Detroit*, 362 U.S. 440, 443. If a legitimate local purpose is found, then the question becomes one of degree. And the extent of the burden that will be tolerated will of course depend on the nature of the local interest involved, and on whether it could be promoted as well with a lesser impact on

> interstate activities." *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970).

This Court recently applied the *Pike v. Bruce Church* test to a state vehicle length regulation in *Raymond v. Rice*, 434 U.S. 429 (1978). The facts of *Raymond* are almost identical to those of this case.

In *Raymond*, Plaintiffs challenged a Wisconsin regulation which prohibited operation of 65-foot twin trailers. The regulation was shown to burden interstate commerce by forcing diversions of traffic around Wisconsin, the shuttling of twins into the state, and the use of 55-foot semis for through traffic where twins would normally be used. Substantial evidence was introduced that twins were as safe or safer than semis. Wisconsin defended on the basis that the regulation bore a rational relation to safety, because, it argued, length is related to safety and it takes longer to pass a twin trailer.

This Court held the regulation to be invalid. It applied the *Pike v. Bruce Church* test, noting that the ban of twins burdened interstate commerce and, on the facts before it, did not promote safety. The Court specifically noted that Wisconsin's reliance on the rational relation test was misplaced. Substantial evidence existed that twin trailers were safe, and the uncontroverted evidence was that factors such as increased passing time were insignificant in the context of Interstate Highways. In addition, Wisconsin had permitted extensive exemptions to its general length limit for the benefit of local interests.

Though *Raymond* applied *Pike v. Bruce Church*, it also enunciated two corollaries to be applied when the local purpose asserted is the promotion of safety. Both corollaries reflect the importance of human life and a concern that safety not be impaired in a balancing of state and national interests.

The first corollary is that where a regulation purports to promote safety, the courts will accord a strong presumption that the regulation in fact does so. To rebut that presumption, plaintiff must do more than merely produce a preponderance of the evidence. Plaintiff must produce sufficient evidence to provide the court with a "firm basis of decision," an assurance that not only is plaintiff's evidence stronger than the defendant's, but that plaintiff's evidence properly reflects reality. The point is particularly made in *Raymond* because of Wisconsin's erroneous reliance on the rational relation test and consequent neglect of the facts.

The second corollary is that if the court determines that the regulation actually promotes safety, the balancing test is pre-empted. The courts will not balance the gain in safety against the economic burden created by the regulation. Unlike the factual determination of whether safety is promoted, the determination of how much safety at what cost is a policy decision for elected representatives, not the courts.[3]

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[3] The two corollaries provide the distinction between *Brotherhood of Locomotive Firemen & Enginemen v. Chicago, Rock Island & Pacific Rrailroad*, 393 U.S. 129 (1968) and *Raymond v. Rice*, 434 U.S. 429 (1978); *Bibb v. Navajo Freight Lines, Inc.*, 359 U.S. 520 (1959); and *Southern Pacific Co. v. Arizona*, 325 U.S. 761 (1945). In *Brotherhood*, the railroads failed to meet either corollary. They did not produce a case sufficiently certain to rebut the presumption. Moreover, the District Court specifically found that the requirement of an extra train crew member increased safety in certain situations, but considered this increase in safety to be too small to justify the added costs caused by requiring the extra crew member in all situations.

In *Southern Pacific*, *Bibb*, and *Raymond*, the plaintiffs were able to produce substantial and convincing evidence that the regulation did not promote overall safety, even though it was claimed to do so in certain respects, such as slack coupling accidents, splash and spray, or passing time. Absent overall promotion of safety, the States could not justify the burden imposed by their regulations.

The District Court and Court of Appeals followed the recent precedent of *Raymond.* To demonstrate grounds for reversal in this case, Appellants must show that (1) the facts *as determined by the lower court*[4] distinguish this case from *Raymond*, or (2) the issues presented are different from *Raymond* and were wrongly decided, or (3) the facts of this case show *Raymond* to be bad policy.

The First two grounds, although raised by Appellants, are not a basis for review by this Court. Absent some showing of national importance, they do not pose a substantial federal question. Only the last ground, that *Raymond* is bad policy, posits a reason for reversal and a reason for review by this Court. Appellants, however, raise this last claim by bald assertion which rests on hyperbole and does not survive examination.

B. The Lower Courts Properly Decided The Only New Issue Presented.

At trial and on appeal, Iowa officials argued that they may force twin trailers to divert around the state so as to achieve local benefits from the reduction in traffice volume. The issue was not presented in *Raymond.* The argument is alluded in the Jurisdictional Statement, though not forcefully presented.[5]

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[4] Appellants confuse distinguishing the adjudicated facts of this case with a license to re-argue the evidence. This Court will not normally grant plenary review for the purpose of reviewing evidence, particularly where the factual findings of the District Court are concurred in the Court of Appeals. *United States v. Johnston*, 268 U.S. 220, 227 (1925); *Graver Tank* & Mfg. Co. v. Linde *Air Prod. Co.*, 336 U.S. 271, 275 (1949); *Berenyi v. Immigration Service*, 385 U.S. 630, 635 (1967). The rule has particular application here. The Circuit Court of Appeals stated the District Court's finding of twin trailer safety to be "based on a record replete with substantiating evidence."
612 F.2d 1064, 1069.

It is important to understand clearly Iowa's argument. The argument does not contend that twin trailers are less safe, or cause more road wear or congestion, than other vehicles. Iowa is asserting that it may, if it so chooses, reduce traffic volume by closing the borders of the state to a portion of interstate through traffic.

The diversion reduces the harmful side effects of traffic in Iowa but increases the total accidents, road wear and congestion associated with the traffic. It is a parasitic relationship. Iowa achieves advantages only to the extent to which other states, and interstate commerce itself, are disadvantaged. Though not facially discriminatory, the argument has, as the District Court noted, "the aura of protectionism usually associated with discrimination against interstate commerce." 475 F.Supp. 544, 551.

Iowa's decision to reduce traffic volume by limiting the movement of interstate commerce of little benefit to Iowa harms not only the national economy by burdening interstate commerce, but also the political union. It engenders the same rivalries and animosities among the states that the Commerce Clause was designed to limit. If Iowa may limit interstate commerce of little benefit to Iowa, another state may limit interstate commerce of little benefit to it. Here, Iowa reduces its traffic volume by diverting twin trailers which are principally moving manufactured articles to the West from the industrial East and Midwest. An industrial state might well choose to reduce its traffic volume by banning grain trucks of little local benefit.

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[5] It is ironic that Appellants only faintly present the argument here. At trial, the testimony of state officials made it clear that the reduction of traffic by diversion was Iowa's principal motivation in banning twins, c.f. Governor's Veto Message, Ex. 53.

If each state may achieve benefits by limiting that part of interstate traffic of little benefit to it, the end result would be a hodge-podge of restraints that would pit one state against the other, and eliminate the freedom of transportation vital to the national economy. This Court has rejected such isolationist approaches to common problems. *Philadelphia v. New Jersey*, 437 U.S. 617 (1978); *Edwards v. California*, 314 U.S. 160 (1941).

C. THE REMAINING ISSUES AND FACTS PARALLEL THOSE OF *RAYMOND*.

1. *The Evidence of Twin Trailer Safety Is Conclusive.*

Under *Raymond*, Plaintiff has the duty of presenting a sufficiently comprehensive case to rebut the presumption of validity accorded the state law in question. If plaintiff's evidence is insufficient to provide a firm and assured basis of decision, the trial court should uphold the state regulation. This Court found the evidence in *Raymond* sufficient to provide a firm basis for decision. The evidence in this case duplicated and went beyond that in *Raymond*.

Appellants claimed at trial that the evidence of twin trailer safety was inconclusive. In their Jurisdictional Statement, Appellants imply that twins are a relatively new and untried vehicle.[6] They further assert that the lack of reliable information left Appellants and intervenor, Motor Club of Iowa, Unable to produce any substantive evidence that twin trailers are unsafe.

The record, however, shows extensive, and in many cases, uncontroverted evidence of twin trailer safety. The record includes:

1. A comprehensive study of 65-foot twin trailers conducted by the Iowa Department of Transportation in 1975, which contained:
   a. A survey of transportation officials in all states then permitting twin trailers;
   b. A review of the engineering aspects of twin trailers vis-a-vis semi trailers;
   c. An in-depth analysis of Missouri's accident records for twin trailers and semis;
   d. A study of comparative accident records of major carriers;

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[6] Sixty-five foot twin trailers are not "new" vehicles. For instance, the ICC in changing its regulations in 1961 to permit carriage of explosives in twins, reviewed extensive data of twin operations occurring between 1954 and 1960. Sixty-five foot twins have been permitted in Iowa under the border city exemption since 1959. A BMCS study reviewed over *two billion* miles of twin trailer operations between 1969 and 1976. The American Association of State Highway and Transportation Officials formally proposed that all states permit their use in 1964. The 65-foot length was recognized as the standard for interchange in 1967 by the Truck Trailer Manufacturers Association and in 1968 by the Society of Automotive Engineers.

   e. Analysis of maneuverability, splash and spray, passing, and aerodynamic disturbance characteristics of twin trailers; and
   f. An overall review of every issue relating to twin trailers that could be identified.

2. A 1965 report of a Governor's commission in the State of Virginia which included:
   a. Maneuverability and braking tests comparing semi trailer and twin trailer performance under varying conditions;
   b. Actual field observations by State Patrol officers of twin trailer operations in other states;
   c. Experimental operations in Virginia under state supervision by one motor carrier;
   d. Driver reaction surveys; and
   e. A review of accident statistics then available.

3. Deposition testimony of state highway officials, including the testimony of the chiefs of highway patrols, safety directors, and other officials from the States of Illinois, Minnesota, South Dakota, Kansas, Montana, Nebraska, and California.

4. Deposition testimony from Kenneth Pierson, Deputy Director of the Bureau of Motor Carrier Safety, U.S. Department of Transportation, and deposition testimony of Ernest Cox, the former Deputy Director.

5. Over ten statistical reviews or studies of twin trailer safety which ranged from simple reviews of state accident records, such as one conducted by Kansas, to very carefully documented, controlled variable, Matched Pair Analysis which compared twin trailer and semi trailer operations over identical routes with equal drivers under similar weather and traffic conditions.

6. A multi-tiered highway safety analysis of twin trailer safety, including detailed examination of accident statistics, accident causes, potential sources of bias, and a review of the available information on twin trailer safety.

7. The testimony of insurance officials as to loss experience and risk estimates for twin trailers.

8. Published engineering studies, tests, and related testimony, including:
   a. Field tests comparing twin trailers in passing maneuvers;
   b. Braking tests comparing twin trailers and semi trailers, and the compliance of both vehicles with federal braking standards;
   c. Computer simulations comparing the stability of twin trailers to that of other vehicles, and actual field tests to verify the computer simulation performed by the Illinois Institute of Technology Research Institute;
   d. Actual field tests of splash and spray done by various groups including vehicle type comparisons done

under contract to the United States Department of Transportation;

e. Field tests of the jackknifing potential of twin trailers done on solid ice by the Winter Driving Hazards Committee of the National Safety Council;

f. A detailed component by component examination of commercial vehicle air brakes comparing twin trailers and semi trailers;

g. Professional papers published by the SAE developing mathematical formulae for predicting dynamic vehicle behavior; and

h. A film showing the behavior of twin trailers during emergency maneuvers at speed.

9. A segment by segment level of service analysis of Interstate 80 in Iowa and the diversion route through northern Missouri.

Appellants' argument of inconclusiveness is specious. The evidence duplicated and went well beyond that of *Raymond*. Moreover, the affirmative evidence weathered exhaustive cross-examination and minute analysis by Appellants.[7] The District Court was unimpressed with Appellants' arguments and specifically addressed the conclusiveness of the evidence:

> "Defendants claim that the evidence is inconclusive on the relative safety issue, and it is a reasonable policy decision for Iowa to make a safety distinction between twins and semis. Defend-

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[7] In their Jurisdictional Statement, Appellants make passing references to a number of items, suggesting that a substantial rebuttal case was presented. The Appendix to this Motion contains a detailed examination of those items.

> ants argue that they should prevail because of the strong presumption. The Court cannot accept this argument as it believes that the evidence clearly establishes that the twin is as safe as the semi." 475 F. Supp. 544, 549.

The Court of Appeals in upholding the District Court's finding of twin trailer safety noted that it was based on a record "replete with substantiating evidence." 612 F. 2d 1064, 1069.

2. *The Trial Court Properly Determined the Overall Safety of Twin Trailers*

The strength and conclusiveness of the facts adduced at trial left Appellants arguing, as Wisconsin did in *Raymond*, that the District Court should not consider the facts. Appellants assert that the trial court should have taken judicial notice of "the relationship between safety and truck size" as a "general proposition of social fact." It should then have noted that the state made a "colorable showing" of a deficiency in some safety related aspect, and terminated its review.[8] Under this analysis, it would be irrelevant that the evidence shows 65-foot twins to be safe. Equally, it would be irrelevant that Appellants' "colorable showing" is illusory, and that the evidence shows the claimed safety deficiencies to be devoid of significance and outweighed by positive safety aspects of the vehicle. In short, the facts would be irrelevant.

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[8] Appellants posit that they need only present a "colorable showing" on the basis of the following sentence in *Raymond*:

> "The State of Wisconsin has failed to make even a colorable showing that its regulations contribute to highway safety." 434 U.S. 429, 448.

Logicians will recognize the fallacy of the converse. That Wisconsin could not even make a colorable showing does not imply that a colorable showing is all that is needed.

As a general proposition, Appellee will concede that length may relate to safety, but the connection is not simple, and limiting length does not necessarily promote safety. A longer vehicle may be more stable, more maneuverable, and present less accident exposure than a shorter vehicle. Other factors such as the articulation of the vehicle, its wheel base and axle configuration, weight, relation of width to length, and cargo capacity, all affect safety. A shorter vehicle is not, *per se*, a safer vehicle.

Appellants' reliance on judicial notice on this subject in the presence of facts to the contrary is misplaced and was specifically rejected in *Raymond:*

> "The District Court, without mentioning this evidence, suggested that language in *Morris v. Duby*, 274 U.S. 135, 144 (1927), and *Buck v. Kuykendall*, 267 U.S. 307, 315 (1925), established a principle 'that for purposes of judicial review of state highway legislation, size restrictions might be deemed inherently tied to public safety . . .' 417 F. Supp., at 1360. The language relied upon does not go so far, and it antedates the era of the limited-access, four-lane divided highways involved in this case. Size restrictions, like other highway safety regulations, are entitled to a strong presumption of validity, but this presumption cannot justify a court in closing its eyes to uncontroverted evidence of record." 434 U.S. 429, f.n. 19.

Nor can Appellants make the presumption of safety irrebuttable by making a "colorable showing" of safety when the evidence shows that colorable showing to be illusory.[9] With some expansion, Appellants' "factual" evidence that twins are unsafe parallels Wisconsin's in *Raymond.* Wisconsin pointed to the greater length of time to pass a twin. Appellants here point to the greater passing time, greater time to cross an intersection, and greater hazard at an accident scene. As in *Raymond,* the evidence shows these claims to be illusory and devoid of practical significance.[10]

As this Court has reiterated, the trial court must determine the "total effect" of the law as a safety measure. Illusory safety claims will not justify the statute, *Southern Pacific Co. v. Arizona,* 325 U.S. 761 (1945); *Bibb v. Navajo Lines, Inc.,* 359 U.S. 520 (1959); *Raymond v. Rice,* 434 U.S. 429 (1978).

To hold otherwise on these facts would be to undercut *Raymond's* primary concern that safety not be sacrificed in the balancing of competing national and state policies. The facts show twin trailers to be safe. If the ban of twins is to be upheld on the basis of disproved presumptions and illusory safety claims, actual highway safety will be sacrificed.

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[9] The Appendix to this Motion contains a discussion of these points in the context of the evidence.

[10] The lack of practical significance is implied by Iowa's numerous exemptions which present a striking parallel to those in *Raymond v. Rice,* 434 U.S. 429 (1978). Wisconsin permitted the movement of newly manufactured twin trailers out of the state, as does Iowa. Wisconsin permitted overlength vehicles to transport automobiles, as does Iowa. Wisconsin permitted twin trailer milk haulers; Iowa permits overwidth loads of hay and overlength hog carriers. Wisconsin permitted overlength operations between plants in Wisconsin and between plants and the border. Iowa permits overlength operations, including 65-foot twin trailers, to and from its border cities. The total number of overlength movements in Iowa is unknown, however, as most of its exceptions are statutory and, unlike Wisconsin, require no permit.

3. *The Burden on Interstate Commerce is Substantial.*

Iowa's ban imposes a burden on interstate commerce quite similar to that in *Raymond v. Rice, supra.* Appellee's ". . . operations are disrupted, their costs are raised, and their service is slowed by the challenged regulation." 434 U.S. 429, 438. The quantifiable, direct economic cost to Appellee is also similar: two million dollars annually. In addition, the evidence in this case shows that the ban increases accidents.

Appellants contend that the diversion and these costs are the result of "a recent voluntary business decision" of Appellee.[11] The decision is not recent, but it is a voluntary choice designed to minimize the economic and safety costs of Iowa's ban. Appellee's only other options are to use semi trailers over its entire transcontinental mainline relay, shuttle twins through Iowa, or transfer and retransfer cargo between twins and semis at Iowa's borders. Each of these options would substantially increase the vehicle miles traveled, thereby increasing costs and exposure to accidents.[12]

Appellants additionally suggest that the burden is insignificant because it constitutes a small percentage of Appellee's total revenues. The appropriate comparison is not to Appellee's operations in 48 states, but to the cost of transporting goods through Iowa absent the ban, c.f. *Ray v. Atlantic Richfield*, 435 U.S. 151 (1978).[13]

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[11] Appellants claim this to be a factual finding of the District Court, Jurisdictional Statement, p. 8. It is not.

[12] Because of a semi's lessened volume, 10% to 16% more vehicle movements would be necessary to move an equivalent amount of general commodity freight.

[13] The Iowa DOT found that the cost to all carriers of its ban exceeded $12,000,000 annually, as of 1974.

Appellants' final suggestion is that Appellee made no showing that the savings would result in lower rates for shippers, Jurisdictional Statement, p. 18. The suggestion is true in only the most limited sense. The testimony was that most of the savings would pass through to shippers under ICC regulation. However, given the very rapid recent increases in diesel fuel costs, these savings would probably result in a lowering of increases, rather than an actual lowering of rates.

D. The Policy Of *Raymond* Is Soundly Applied In This Case.

The result reached by application of *Raymond* in this case is reasonable. Appellants have virtually conceded that their ban on twins does not actually promote safety. Their own study found 65-foot twins to be safe vehicles. That study also showed that the ban imposed a significant burden on interstate commerce, and caused a total increase in the number of accidents associated with the traffic. Iowa obviously wishes to continue to divert traffic. Yet, their nominal reference to the diversion argument without discussion implies that they know their position to be constitutionally unsound.

The *Raymond* policy, they contend, spells an end to any state regulation of vehicle size. If such were the case, the policy would be bad. The facts of this case and the logic of *Raymond*, however, do not suggest the end of state regulation. Here, the vehicle banned is safe. If it were not, *Raymond* would uphold the statute. Indeed, were the evidence on safety less certain, *Raymond* would uphold the statute. If the vehicle banned were not a standard vehicle widely used, the burden on interstate commerce would not be significant, and *Raymond* would uphold the statute. If Iowa had significant local benefits achieved by the statute, other than those achieved at the expense of her neighbors, *Raymond* would uphold the statute.

Appellants' assertion that *Raymond* will not permit reasonable regulation of vehicle size, rests on the hyperbole of counsel, not the holdings of *Raymond* or the holding of this case. Here, Iowa's regulation must bow, for it is unreasonable. It burdens interstate commerce and does not accomplish its goal of promoting safety.

CONCLUSION

Appellants' vigorous advocacy at trial and on appeal failed to distinguish the substance of this case from that of *Raymond v. Rice*, 434 U.S. 429 (1978). The District Court and Court of Appeals properly followed that recent precedent in holding that Iowa's ban of 65-foot twin trailers violated the Commerce Clause.

The decision in this case is consistent with the policy factors underlying both the Commerce Clause and this Court's application of the Clause to state regulation of interstate commerce.

For the foregoing reasons, Appellee respectfully requests that this Honorable Court grant this Motion to Summarily Affirm the court below.

Respectfully submitted,

JOHN H. LEDERER

JOHN DUNCAN VARDA
ANTHONY R. VARDA

DeWITT, SUNDBY,
HUGGETT & SCHUMACHER, S.C.
121 South Pinckney Street
Madison, Wisconsin 53703

March 28, 1980

APPENDIX

In their Jurisdictional Statement, Appellants make passing references to items of evidence supposedly supporting their contentions, thus implying that Iowa presented a substantial factual case. Iowa did argue its case vigorously, but did so in the absence of facts to support the arguments. Though Appellants have not directly contended that the District Court's factual findings are erroneous, their disregard of these factual findings requires some discussion of the facts they assert.

"COLORABLE SHOWING"

Appellants contended that they introduced evidence of increased passing time, additional intersection congestion, and greater hazards at the scene of the accident, amounting to a "colorable showing" that twin trailers are unsafe. The facts show the claims to be illusory.

Passing. At a 10 m.p.h. speed differential, a twin trailer takes one-third of a second longer to pass than a 60-foot twin or livestock carrier, two-thirds of a second longer than a 55-foot semi. The difference is inconsequential, particularly since in actual practice, passing vehicles tend to accelerate until they pass the other vehicle, reducing the time differential. Numerous witnesses testified that the passing time difference was devoid of significance. They included Col. James Crawford, Minnesota Highway Patrol; Thomas Doyle, former Director-State Engineer, Nebraska Highway Department; Prof. Archibald Easton; Col. Dennis Eisnach, Superintendent, South Dakota Highway Patrol; Dr. Arland Hicks, Safety Director, Kansas Highway Department; Joel Leisch, Transportation Analyst; Major James Adkins, Kansas State Highway Patrol; Claud McCamment, former Safety Director, Kansas Highway Department; Fred Meyers, highway engineer; John Nimmo, Iowa Transportation Department engineer; Kenneth Pierson, Deputy Director, Bureau of Motor Carrier Safety, United States Department of Transportation; Thurman Sherard, Chief Engineer, Western Highway Institute. The 1975 Iowa DOT Study concluded:

> "The data shows that a slight increase in length has no significant impact on the passing distance."

Moreover, in bad weather, a twin is easier to pass, as it produces 20% less splash and spray than a semi, a fact determined by tests, and noted in actual experience by many of the witnesses.

Intersection Congestion. There are no intersections on Interstate Highways, the only intersections at issue in this case are those involved in stops for food, fuel, or access to terminals. The same fraction of a second difference noted in passing would apply to a twin trailer crossing an intersection. If the intersection involved a sharp turn or other maneuver, the twin trailer would cause less problem because of improved maneuverability. Iowa's claim of concern for intersection conflicts is traduced by the border city exemption which allows unrestricted operation of 65-foot twin trailers on city streets.

Hazard at Accident Scenes. The record is devoid of support for the contention that a 65-foot twin trailer presents greater hazard at an accident scene. Col. Edward Dickinson, Chief of the Iowa Highway Patrol, speculated that a twin trailer would present a hazard if it could not be backed to clear an accident. He did not know if the vehicles could be backed.

***

"Q. When I listened to your testimony, with the exception of backing — correct me if I am wrong, because I don't want to mischaracterize your testimony — but all of the problems that you addressed in regard to your testimony were problems that you associated with large trucks, generally?

A. [Col. Dickinson] Yes, that's true.

Q. With the exception of backing, you are in no way — you were in no way suggesting that this problem is greater with 65-foot twins than with a 60-foot twin, or another semi?

A. No, that's right.

Q. Do you have an opinion as to whether the 65-foot twin is safer or less safer than a 55-foot semi?

A. I really don't. I'm not that all familiar with the exception of that one characteristic.

Q. Do you know how far a 65-foot twin trailer can be backed?

A. No, with the exception of information that has been given to me about those.

Q. Who gave you that information?

A. I don't recall. It was in an earlier — it might have been back in the earlier trial. As I recall, it came up during that time, but that's the only one question I have about their real safety, other than any operational problems.

Q. You don't know how far, if at all, they can be backed?

A. No. I would imagine it might depend upon — somewhat upon the operator, but I can't positively feel that they could be successfully backed for any distance without losing their control.

> Q. If the units can be backed up sufficiently, would you regard that as reducing or negating your concern?
>
> A. Yes, if it could be demonstrated to me that this could be successfully done, I certainly would feel differently about that problem." Tr. pp. 1188-1190.

The record shows that twins can be backed sufficiently to clear an accident scene, c.f. Ex. 71, Virginia Twin Trailer Study, which reports the tested backing ability of 65-foot twin trailers.

These three items constitute Appellants' "colorable showing" that twin trailers are unsafe.

REBUTTAL EVIDENCE

In their Jurisdictional Statement, Appellants contended that Iowa introduced evidence tending to rebut plaintiff's case for the safety of twin trailers. They mention jackknives and upsets in snow and ice, the "overall" accident rate for CF doubles in 1975, 1976, and 1977, some drivers' opinions, and refutation of CF's statistics and the BMCS study.

Jackknives and Upsets in Snow and Ice. CF operates twin trailers in those states where they are legal; it operates only semis in the East and Southeast.[14] Not surprisingly, CF has more twin accidents in snow and ice, and more semi accidents in rain because of this geographical difference. Appellants' own expert noted the geographical difference and that the accidents in snow and ice are the result of exposure differences:

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[14] The semi operations in the Southeast affect national operations. The southern transcontinental route from the Southeast across Texas, New Mexico and Arizona has considerable semi traffic. The northern route through Wisconsin, Minnesota, the Dakotas, Montana, and Idaho, and the central route through Iowa are almost entirely (80%) twin traffic.

"Q. Looking at accidents overall, did you make any observation in regard to exposure?

A. [Dr. Koehler] I think my observations would be the same as those presented in Mr. Glennon's exhibit; that doubles had a higher rate of accidents in snowy and icy conditions, but that was not surprising to me after I was told that the doubles don't operate in the southeast. A large number of CF tractor semis operate there.

Q. In other words, some of these differences in accident type are quite probably caused by differences in exposure rather than differences in the vehicle configuration?

A. That's true.

Q. And the converse of that, it would be erroneous to claim that the higher number of jackknives for twins or the higher number of rear-end accidents for semis is the result of the vehicle configuration rather than being the result of exposure for — or differences in exposure?

A. Yes, just from the data we have available."
Tr. 1752-1753.

Appellants' counsel has no compunction about now asserting the conclusion which Appellants' own expert said would be erroneous.[15]

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[15] Jackknifing tests on glare ice by the Winter Driving Hazards Committee of the National Safety Council found no significant difference in jackknifing on slippery surfaces for semis and twins. The Chairman of that Committee, Prof. Archibald Easton, testified that twins would start to jackknife slightly more readily, but could be better controlled and would recover more easily. He reiterated in testimony the overall conclusion, based on years of testing, of his 1972 paper, "Jackknifing of Articulated Vehicles on Slippery Surfaces":

> ". . . The safety of the 55-foot tractor semi trailer and the 65-foot twin trailer combinations is not significantly different." Easton deposition, Ex. 7, p. 3.

1975, 1976 and 1977 Accident Rates. The reference to a higher overall accident rate for twins in 1975, 1976, and 1977 is false.

Most truck accidents are minor and involve damage to the trailing equipment. The trailing equipment of a semi costs $10,600; the trailing equipment of a twin, $17,400. Twins also carry more cargo. As a result, an accident of the same magnitude will generally cause more dollar damage to a twin than semi. Both Appellee's expert, Dr. Glennon, and Appellants' expert, Dr. Koehler, agreed that use of a minimum dollar cut-off for biased the statistics against twins.[16]

Appellants' only support for their contention of higher "overall" accident rates are rates using a $250 dollar minimum cut-off for reporting. Even those rates show no year in which the twin rate is statistically significantly above that of semis,[17] but numerous years when the reverse is true. Over the entire eight-year period, the higher semi accident and injury rates are statistically significant, a fact found by both experts.

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[16] The bias is not small. Based solely on CF equipment damage, a $250 cut-off would have reported only 38% of all semi accidents, but 53% of all twin accidents in 1978. The variation is truly the result of the difference in equipment cost and not differences in accident severity. Semis had a higher percentage of injury or fatality producing accidents, despite the lower dollar damage.

[17] "Statistically significant" refers to a determination of whether an observed difference reflects an actual difference or merely random variations. The determination varies with the size of the sample and of the difference. Experts on both sides agreed on the importance of determining whether differences were statistically significant, and jointly used the formula for statistical significance developed by Appellants' expert.

Drivers' Opinions. Some CF drivers prefer semis, some prefer twins. As one driver put it, having a preference between twins and semis, is: ". . . just personal. Some people like redheads, and some people like blondes." Gianforte deposition, p. 22.

The trial court properly concluded: "Although some drivers preferred the handling characteristics of semis over twins, none felt that twins were unsafe." 475 F. Supp. 544, 549.

Statistics. Appellants state that their expert "refuted the validity" of various statistical studies offered by CF. The statement in one sense is true. Appellee presented to the trial court every statistical study it knew to exist. Appellee's expert, Dr. Glennon, then pointed out the failings of numerous studies and the reasons why they could not be relied upon. Appellants' expert, Dr. Koehler, concurred. After extensive analysis of CF's data for possible sources of bias, Dr. Glennon concluded that the CF data was without bias favoring twins. Dr. Koehler concurred, at least for 1978. The experts disagreed, however, on the Bureau of Motor Carrier Safety study. Dr. Koehler speculated there might be bias, though he knew of none nor which vehicle might be favored. Dr. Glennon tested the study for bias, and concluded that there was none.

Dr. Koehler's supposition that there might be bias hardly constituted refutation of the study. The trial court noted in its opinion that there were many studies that had biases. The trial court did not find the BMCS study to have bias. It relied most heavily on CF's data, admitted by both experts to be free of bias favoring twins, and on the Matched Pair study, whose methodology was approved by both experts.[18]

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[18] The Matched Pair study was used to eliminate any uncontrolled variables that might affect the comparison. The study involved extracting trips in which both twins and semis traveled at approximately the same time, over the same roads, and with equivalent drivers. Over 188,000 trips covering 112,000,000 miles of comparable travel resulted. The accident rates for the two vehicles on these trips were then compared. There was no statistically significant difference in the accident rates of the two vehicles, though Dr. Koehler noted that the study provided "moderately strong" evidence that semis had more injury producing accidents because the difference in injury rates was almost significant.

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A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

REPLY TO MOTION TO AFFIRM

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General

Attorneys for Appellants

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

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A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

REPLY TO MOTION TO AFFIRM

Consolidated Freightways, in its Motion to Affirm, makes several contentions that warrant a brief reply.

First, the Motion is premised upon a faulty articulation of the issues below. CF continues to suggest that Iowa discriminates against double-bottoms because of their configuration and that they should prevail if a trial court finds as a matter of adjudicative fact that a particular vehicle excluded by a generally applicable length limitation is as safe or safer than other shorter vehicles which a state permits to operate on its highways. Iowa allows double-botton trucks on its highways. Iowa has allowed double bottom trucks to operate at sixty feet, five feet longer than semi-trailers may operate. Sixty-five foot doubles are excluded not because of their configuration, but because they are too long.

Iowa contends that this result is consistent with the dormant commerce clause because the record reflects that length is related to safety and because CF has not shown that the particular line-drawing in the Iowa statute is irrational. CF's Motion to Affirm makes their real contention more visible. CF's true contention is that a state may not regulate vehicle length by general classification. Rather, they claim the dormant commerce clause empowers a federal district court to evaluate the safety hazards of a particular type of vehicle on a particular category of road and order a state to permit the operation of that vehicle on that category of road if it concludes by a preponderance of the evidence that the vehicle is as safe as others permitted on that road by the state. The courts below implicitly accepted that claim. This Court should not.

Second, it should be noted that CF concedes a general relationship between length and safety. Motion to Affirm at 15. They suggest the relationship is not simple. Of course it is not simple. Indeed, it is still being studied by federal authorities. But it does not follow that a state may not regulate by rational classification and must rather make individualized safety determination for every vehicle an interstate carrier may wish to operate.

Third, CF claims that this case is controlled by *Raymond* and that Iowa is simply seeking to reargue that recent decision. Not surprisingly, CF chooses to ignore totally the argument presented in Appellant's Jurisdictional Statement. That argument need not be restated here. Suffice it to say Iowa argues that the courts below seriously misinterpreted *Raymond*, with the result that the states may no longer regulate vehicle size. The need to alleviate this substantial departure from accepted principles of dormant commerce clause analysis plainly makes the question presented substantial.

Fourth, CF notes that *Raymond* may be reconciled with the Court's decision in *Brotherhood of Locomotive Firemen & Enginemen*. Motion to Affirm at 6, n. 3. Iowa could not agree more. What cannot be reconciled with *Brotherhood*, as Judge Henley noted, is the decision of the courts below in this case. Were this Court to grant CF's Motion to Affirm, *Brotherhood* would be overruled *sub silentio*.

Finally, CF seems to respond to Iowa's contention that the decision below spells an end to state regulation of vehicle size by the suggestion that only the Iowa statute has been invalidated. Motion to Affirm at 18-19. The record reflects that most eastern and southeastern states do not permit sixty-five foot doubles to operate on their highways. Motion to Affirm at 4a. But it is the Constitution of the United States we are expounding. It cannot be the case that doubles may be prohibited in Georgia while operating under federal court order in Iowa. A constitutional analysis which even suggests such a result is possible is palpably unsound. Moreover, focussing on the prohibition of doubles in the East and Southeast lays bare one of the principal reasons why the decisions of the courts below are unsound. CF claims interstate commerce is burdened because Iowa's limitation, in an area of the country where sixty-five foot doubles are generally permitted, forces it to "divert" its equipment through other states. No such claim is or can be made for the East and Southeast. CF notes: "CF operates twin trailers in those states where they are legal; it operates only semis in the East and Southeast." Motion to Affirm at 4a. CF goes on to claim that the southern transcontinental route has considerable semi traffic (but that the central route is almost entirely twin traffic. *Id.* at n.14. Thus, Iowa's length limitation is no more inherently burdensome than Georgia's. The so-called "burden" is entirely a function of CF's voluntary business decisions and the legislative decisions of other midwestern states. CF is not "burdened" in the East and Southeast because it made a different business decision. This Court should not permit CF to succeed in bootstrapping its way over reasonable state limitations on vehicle length.

CONCLUSION

For these additional reasons, this Court should note probable jurisdiction of this appeal.

Respectfully submitted,

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General

Attorneys for Appellants

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No. 79-1320

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

RAYMOND KASSEL, *et al.*,
Appellants,
v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

---

BRIEF FOR APPELLANTS

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312
(515) 281-5191

ROBERT W. GOODWIN
Special Assistant Attorney General

LESTER A. PAFF
Assistant Attorney General
Attorneys for Appellants

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

QUESTIONS PRESENTED

1. Whether, when a state justifies a statute limiting the length of vehicles which may operate on its highways by reference to an interest in safety, and that justification is challenged in a suit under the dormant Commerce Clause, the District Court should inquire only whether a rational legislature could conclude that the length of vehicles is generally related to highway safety.

2. Whether, when conflicting evidence is presented on legislative fact questions concerning the nature and extent of the relationship between the length of vehicles and highway safety, the presumption of constitutionality imposes upon the challenger a burden of persuasion by clear and convincing evidence.

3. Whether, when a District Court makes "findings of fact" adverse to the asserted justifications for a state statute challenged under the dormant Commerce Clause, the deference due state legislative judgments requires de novo review by appellate courts of those factual findings rather than application of the clearly erroneous standard of Fed.R.Civ.P. 52.

4. Whether on this record it may be concluded that Iowa is irrational in permitting double-bottom trucks only five feet of additional length beyond that permitted conventional semi-trailers.

5. Whether, in the absence of Congressional action, recent increases in vehicle lengths permitted by some neighboring states and voluntary business decisions by some trucking firms may effectively preempt Iowa's long-standing judgment concerning the length of vehicles which may operate within its borders.

6. Whether the size of vehicles permitted to operate on a state's highways is a subject requiring uniform national standards such that the dormant Commerce Clause absolutely precludes all state regulation of vehicle size.

LIST OF PARTIES

APPELLANTS

Raymond Kassel—Director of Iowa Department of Transportation

Robert Rigler—Member and Chairman of Iowa Transportation Commission

L. Stanley Schoelerman—Former member of Iowa Transportation Commission

Donald Gardner—Member of Iowa Transportation Commission

Jules Busker—Member of Iowa Transportation Commission

Allan Thoms—Member of Iowa Transportation Commission

Barbara Dunn—Member of Iowa Transportation Commission

William McGrath—Member of Iowa Transportation Commission

Jon McCoy—Former Director of Motor Vehicles Department of Public Safety

Charles W. Larson—Former Commissioner of Iowa Department of Public Safety

Edward Dickinson—Chief of the Iowa Highway Patrol

Richard C. Turner—Former Attorney General of Iowa

Robert D. Ray—Governor of the State of Iowa

APPELLEES

Consolidated Freightways Corporation of Delaware Operating as a Common Carrier

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IN THE

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RAYMOND KASSEL, *et al.*,
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CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

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BRIEF FOR APPELLANTS

OPINIONS BELOW

The opinion of the court of appeals (Jurisdictional Statement App., pp. 1a-14a) is reported at 612 F.2d 1064 (8th Cir. 1979). The opinion of the district court (Jurisdictional Statement App., pp. 15a-36a) is reported at 475 F.Supp. 544 (S.D. Iowa 1979).

JURISDICTION

The judgment of the court of appeals was entered on December 7, 1979. Notice of Appeal was filed January 4, 1980, and a supplementary Notice of Appeal was filed February 5, 1980 (Jurisdictional Statement, pp. 37a-38a). Probable jurisdiction was noted on May 19, 1980 (A. 3). The jurisdiction of this Court rests upon 28 U.S.C. § 1254(2).

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED

Article I, Section 8, United States Constitution:

> The Congress shall have power . . . to regulate commerce with foreign nations, and among the several States, and with the Indian tribes . . . .

Section 321.457(6), Iowa Code (1979):

> 6. No combination of three vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of sixty feet.

Section 321.457 is set forth in its entirety as an Appendix to this Brief.

STATEMENT

This is an appeal from a decision by the United States Court of Appeals for the Eighth Circuit affirming an order by the District Court finding unconstitutional an Iowa statute limiting double-bottom trucks to 60-feet in length and requiring the State of Iowa to allow 65-foot, double-bottom trucks on its interstate highways and access roads within five miles of an interstate.

The plaintiff below, Consolidated Freightways Corporation (hereinafter "CF"), is a regular route common carrier of general commodities operating in forty-eight states under a Certificate of Public Necessity issued by the Interstate Commerce Commission. Defendants below are individual officers of the State of Iowa (hereinafter "Iowa"), responsible in varying degrees for the enforcement of Iowa's motor vehicle laws. Motor Club of Iowa, a not-for-profit group organized to advance the interests of the motoring public, intervened below in defense of the Iowa statute, but has not appealed from the order of the District Court.

The statute challenged by CF represents the Iowa legislature's longstanding judgment concerning the permissible length of trucks of various configurations. Iowa restricts most truck-tractor, semi-trailer combinations to 55 feet.[1] It is only combinations of three or more vehicles (double-bottoms) and semi-trailers hauling livestock, mobile homes, or transporting other highway or farm vehicles and implements, which are permitted a maximum length of sixty feet. Section 321.457, Iowa Code (1979). Equipment carried on vehicle or implement carriers is permitted to extend three feet beyond the front or rear bumpers, provided the overall length of the load does not exceed 65 feet, § 321.457(5). None of the defendants has discretion to permit exceptions to these limitations for divisible loads.[2]

CF contends that the 65-foot double-bottom trailers (hereinafter "doubles") it prefers to operate are as safe or safer than 55-foot semi-trailers (hereinafter "semis") and 60-foot doubles, at least on interstate highways, and that interstate commerce is burdened by their inability to operate the same 65-foot doubles through Iowa which are permitted in surrounding states. Iowa defends its generally applicable statutory length limitations by reference to its interests in maximizing highway safety and minimizing the cost of highway maintenance.

The proceedings below developed an extensive record consisting of some 52 evidentiary depositions, 14 days (2,000 pages) of trial testimony and several hundred exhibits. In support of its claim that 65-foot doubles are as safe as semis, CF offered several statistical studies and the opinions of expert witnesses and officials from states in which large doubles are legal. In addition to the testimony offered in *Raymond Motor Trans., Inc.* v. *Rice*, 434 U.S. 429 (1978) (hereinafter "*Raymond*"), CF produced a "matched-pair" study which attempted to compare the accident records of its own 55-foot semis and 65-foot doubles under similar conditions. (A. 283-286). Neither the studies nor expert witnesses focused primarily on direct comparisons of 60-foot and 65-foot doubles. (A. 314). CF also offered: a 1975 report to the Iowa legislature by the Iowa Department of Transportation surveying issues relating to increasing the length limitation of doubles to 65 feet, consisting of a survey of opinions of officials from other states and an analysis of the then-existing data and professional literature (A. 580-601); various engineering studies relating to such vehicle characteristics as braking, stability, splash and spray, jacknifing and emergency maneuvers (A. 93-153); and a level of service analysis for Interstate 80 and an alternative route through northern Missouri. (A. 387-396, 406-413, 632-635). CF attempted to quantify its claim that Iowa's length limitation burdens interstate commerce by a presentation based on internal data estimating the added miles traveled by both its 55-foot semis and 65-foot doubles because: 1) CF routes its transcontinental traffic on Highway 36 through northern Missouri rather than on I-80 through Iowa, 2) CF uses Iowa doubles (60-foot) or shuttles a single trailer for Iowa terminal traffic, and 3) CF uses semis or routes doubles around Iowa on its north-south traffic. (A. 382).

---

[1] Effective May 24, 1980, combinations of vehicles (including semi-trailers and double-bottom trailers) are permitted a maximum length of 60 feet. 1980 Iowa Legis. Serv. 80-87 (West).

[2] Chapter 321E, Iowa Code (1979) provides for single-trip or annual permits for indivisible loads and certain other exemptions not discussed by the courts below.

Iowa offered additional studies (A. 207-210, 215-225) and data from CF's own records (A. 649, 668-675) bearing on the comparative safety of semis and 65-foot doubles. This evidence raised questions about whether long doubles had higher fatality rates and more frequent accidents in which significant property damage occurred. Iowa's expert statistician explained the methodological flaws in the studies offered by both parties. (A. 469-499). Iowa's evidence did show that doubles are more prone than semis to jackknife and upset. (Jurisdictional Statement, hereinafter "JS," at 21a).

On the question of the relationship between length and safety generally, Iowa offered an expert engineer who submitted mathematical tables relating the time and distance required to pass different length vehicles at different speeds. (A. 503-505). An expert traffic engineer tabulated the increased exposure of longer vehicles during intersection maneuvers. (A. 451-468, 655-662). The Chief of the Iowa Highway Patrol testified that longer vehicles may create safety hazards at the scene of an accident. (A. 399-400). This record also reflects that all states regulate the length of vehicles which may operate on their highways (A. 465) and that the Federal Highway Administration is in the midst of Project No. 1-U, a massive effort to determine various safety aspects of increased vehicle size and weight and their effect on other highway users. (A. 202-203).

Iowa also vigorously disputed CF's effort to establish a burden on interstate commerce. Iowa's expert economist challenged the use of CF's costs to quantify the alleged burden and established, even using CF's figures, that the effect, if any, on shipping rates was less than ⅓ of one percent. (A. 453). Iowa argued that it was unfair to attribute the diversion of traffic around Iowa to its longstanding length limitation rather than to CF's voluntary business decisions and the more recent legislative decisions of surrounding states.

Nonetheless, the District Court found that Iowa's 60-foot limitation "caused" CF's diversion of its equipment around Iowa and into states in which it could be lawfully operated. Although it recognized the effort made by Iowa to reinforce the "strong presumption of the validity" of the statutory limitation as a safety measure (JS at 20a), the District Court found as an adjudicative fact that "there is no valid safety reason for barring doubles from Iowa's highways *because of their configuration.*" (Emphasis added). The District Court further stated that "[t]he evidence convincingly, if not overwhelmingly, establishes that the 65-foot twin is as safe as, if not safer than, the 60-foot twin and the 55-foot semi." (JS at 21a). In balancing Iowa's interests in length limitations against the burdens on interstate commerce, the District Court stressed the proposition that *interstate* highways are not a local concern. At the same time, the District Court explicitly rejected CF's claim that Iowa's length limitations discriminated against interstate commerce. The court found the regulations neutral on their face and that CF had not proven any discriminatory enforcement. All but one of the statutory exceptions were found to be consistent with the state's concern for safety. (JS at 29a-30a). Finally, the District Court called for action by Congress:

> The trucking industry has long played leapfrog with weight and length limitations to achieve alternate increases. Truckers that haul products that "cube out" before they "weigh out" ask for an increase in length of a few feet so they can take advantage of the weight limit. Then those truckers that haul products that "weigh out" before they "cube out" ask for weight increases so they can utilize the additional length. It is not difficult to establish that the small increase in weight or length creates no additional safety hazard or damage to highways. With some officials saying 108 foot triple-bottoms impose no additional safety hazard on interstates, there appears to be no end in sight.
>
> If this concern points to anything of particular significance, it is that the interstates should be treated differently than other highways. Regulations regarding the length, width and weight of vehicles using the interstate system should be uniform. Congress should pre-empt this area of the law and set these standards.

(JS at 27a-28a).

The Eighth Circuit affirmed, holding that the dormant Commerce Clause required Iowa to permit CF to operate doubles 10 feet longer than the limit for semis; the five additional feet already permitted by Iowa is constitutionally insufficient. Reading *Raymond Motor Trans. Inc.* v. *Rice*, 434 U.S. 429 (1978), to require a Federal District Court to determine whether safety justifications are substantive as a matter of adjudicative fact (JS at 7a), the Court of Appeals concluded that the District Court's Findings of Fact rejecting Iowa's interest in safety were not "clearly erroneous." *Id.* However, in contrast to the Findings and Conclusions of the District Court, the Court of Appeals held that the cumulative effect of several "exemptions" from Iowa's length limitations constituted a "factor weakening the presumption in favor of a safety regulation." (JS at 10a). Moreover, the "exceptions" were said to reduce the court's "willingness to assume that the State's own political process serves as a check on burdensome regulations." (JS at 11a). Judge Henley, writing *dubitante*, noted that the Court of Appeals' reading of *Raymond* was difficult to reconcile wih the rule of *Brotherhood of Locomotive Firemen & Enginemen* v. *Chicago, R.I. & P.R. Co.*, 393 U.S. 129, 138-39 (1968), that "the District Court's responsibility for making 'findings of fact' certainly does not authorize it to resolve conflicts in the evidence against the legislature's conclusion or even to reject the legislative judgment on the basis that . . . the legislative viewpoint constitutes nothing more than . . . pure speculation." (JS at 12a).

SUMMARY OF ARGUMENT

I. Iowa's nondiscriminatory statute limiting the length of doubles to 60 feet was held to impermissibly burden interstate commerce primarily because the courts below rejected the claim that the statute advances a local interest in safety. Iowa's safety claim was rejected because the courts below addressed the question of whether a 65-

foot double is as safe as a 60-foot double or a 55-foot semi, rather than the proper question of whether the length of vehicles is generally related to their safety. This is the proper question because 1) 65-foot doubles are not permitted in Iowa because of their *length*; Iowa permits the double *configuration*, and 2) the nature of a state's interest cannot be fairly and accurately assessed if a court focusses on marginal differences between the permitted and prohibited rather than on the correlation of variables.

The courts below also misperceived the nature of the issue by treating the relationship between length and safety a question of adjudicative fact rather than legislative fact. As a result, the courts below failed to ask whether CF had demonstrated by clear and convincing evidence that the legislature lacked a rational basis for concluding that the length of vehicles is related to their safety. Put differently, the Iowa statute was not afforded the standard of review required by the presumption of constitutionality.

The Court of Appeals erroneously concluded that the presumption of constitutionality to which Iowa was otherwise entitled was weakened by several "exceptions" to the length limitation. However, because CF did not prove a discriminatory purpose, the Court of Appeals engaged in an impermissible psychoanalytic inquiry into the "motives" of the Iowa legislature. Here, unlike in *Raymond*, the exceptions do not permit the inference that those interested in carrier efficiency are unrepresented in the Iowa legislature.

CF offered little evidence bearing directly on the question of the relationship between length and safety. Although the evidence does not reveal the precise nature and magnitude of the relationship, it does reveal an overwhelming consensus among legislatures and highway administrators that all facets of vehicle size, including length, should be limited. Evidence relating to such specific length-related problems as visibility, lane intrusion and removal at the scene of an accident, was also introduced. CF did not establish that the safety of vehicles is unrelated to length.

II. If length is related to safety, establishing a particular limit is essentially a matter of line-drawing. Iowa's 60-foot limit is within the general range employed in other jurisdictions and CF has not shown that ten additional feet beyond the length permitted semis is constitutionally required. Permitting a challenger to isolate marginal differences in length would permit the trucking industry to eliminate all length limitations, one small step at a time.

III. A burden claim based on diversion of equipment around Iowa is a bootstrap grounded in CF's voluntary decisions and the recent legislative decisions of other states and it is unfair and inaccurate to characterize the length limitation as the *cause* of the burden. The only arguable burden fairly attributable to Iowa is any demonstrable difference in efficiency between 65-foot and 60-foot doubles. CF has not shown that to be significant. Even were it appropriate to attribute CF's claimed burden to Iowa's length limitation, expert testimony demonstrates that the impact on shipping rates, if any, is insignificant according to the standards employed in *Ray* v. *Atlantic Richfield Co.*, 435 U.S. 151 (1978).

IV. Once it is established that Iowa's nondiscriminatory length limitation reflects an interest in safety, the outcome of the Commerce Clause balancing process is no longer in doubt. Prior decisions of this court reveal strong deference to state highway regulations. Congressional acquiescence in a long line of decisions treating highway safety regulations as matters of local concern, as well as direct evidence, indicates that Congress agrees that uniformity is not required. This Court has not overridden legislative judgments that an incremental increase in safety outweighs minor economic costs to interstate business.

ARGUMENT

Challenges to state safety regulations under the dormant Commerce Clause frequently present analytic difficulty. Nonetheless, certain general principles of adjudication have emerged which provide a framework within which a detailed argument may be presented. Congress possesses exclusive authority to regulate interstate commerce, qua interstate commerce, and the states may not erect barriers to the free flow of interstate commerce. However, in the absence of congressional regulation, states may adopt nondiscriminatory regulations of local activities within their borders to promote the health, safety and welfare of its citizens, even if such regulations have an incidental impact on interstate commerce. *Raymond*, 434 U.S. at 440. To insure that states do not engage in economic protectionism under the guise of police power regulation, federal courts will not conclusively presume that the stated purpose of state regulation is necessarily its real motive. *Hunt* v. *Washington State Apple Advertising Comm'n*, 432 U.S. 333, 352 (1977). Once it is determined as a threshold matter that the purpose and effect of the state regulation relate to legitimate state interests, it may still be necessary for a federal court to balance competing interests to determine whether "the burden imposed on such commerce is clearly excessive in relation to putative local benefits." *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970). However, where a court is satisfied that a regulation advances a state interest in highway safety, great deference will be afforded legislative judgments concerning the relative importance of safety benefits in comparison with incidental economic costs. *Raymond*, 434 US. at 443-44, 449-50; *Bibb* v. *Navajo Freight Lines*, 359 U.S. 520, 524 (1959); *South Carolina Highway Dept.* v. *Barnwell Bros. Inc.*, 303 U.S. 177, 190-91 (1938); *Sproles* v. *Binford*, 286 U.S. 374, 388-89 (1932). See also *Brotherhood of Locomotive Firemen & Enginemen* v. *Chicago, R.I. & P.R.Co.*, 393 U.S. 129, 139-40 (1968) (hereinafter "*Firemen*").

Guided by these accepted principles, the courts below should have addressed three principal questions in resolving the issues tendered to them: 1) Can Iowa's vehicle length limitations § 321.457, Iowa Code (1979), taken as a whole, fairly be characterized as a highway safety measure? 2) Is it constitutionally reasonable to limit double-bottom trailer combinations to 60 feet? 3) Assuming that § 321.457 is a reasonable safety measure, does it impose burdens on interstate commerce that clearly outweigh the safety benefits?

In Point I of this brief, Iowa will demonstrate that this is the proper framework within which to evaluate the evidence and that, had the courts below properly analyzed the record, Iowa's length limitation would have been characterized as a highway safety measure. In Point II we will show that CF has not proven Iowa unreasonable in drawing the line for vehicle length at 60 feet. In Point III CF's claimed burden on interstate commerce will be critically evaluated. Finally, it will be shown in Point IV that when Iowa's safety interest is factored into the Commerce Clause balancing process, this reasonable length limitation is easily sustained.

I. IOWA'S LIMITATIONS ON TRUCK LENGTH ARE SAFETY REGULATIONS FOR PURPOSES OF BALANCING LOCAL INTERESTS AGAINST CLAIMED BURDENS ON INTERSTATE COMMERCE.

Iowa asserts in this litigation that highway safety is an important interest served by § 321.457. CF challenges this assertion by claiming as a matter of adjudicative fact that a 65-foot double is as safe as other vehicles which Iowa permits to operate on its highways and by implicitly arguing that a state may not legislate by general classification. CF's contentions have resulted in serious confusion of the issues in the courts below. When that confusion is dispelled, Iowa's interest in safety may no longer be disregarded.

A. Iowa's Vehicle Length Limitations Are Safety Regulations If, As a Matter of Legislative Fact, Length is Generally Related to Safety.

First, it is important to stress that § 321.457 is a generally applicable limitation upon the *length* of various classes of trucks. CF contends, however, that the 65-foot doubles it prefers to operate are not permitted on Iowa highways because of their *configuration*, despite the fact that the semi-trailer configuration, the principal alternative for general commodity carriage, has been allowed less length on Iowa's highways. Plainly, however, § 321.457 limits no truck because of its configuration. Rather, the statute establishes different length limits for different classes of vehicles. Only one of the variables considered is configuration. The Iowa limit for the doubles configuration is 60 feet; the Iowa limit for the semi-trailer configuration has been 55 feet.[3] Iowa does not discriminate against the doubles configuration. Thus, for purposes of determining whether § 321.457 advances an interest in safety, the important question is whether the *length* of trucks is generally related to their safety.

In determining the *nature* or *character* of the local interest, a federal court should focus upon the *general* relationship between length and safety, and not, as occurred below, upon the comparative safety characteristics of two particular types of vehicles of marginally different lengths. By way of illustration, consider a limitation on the companion dimension of truck width, which it may be assumed all concede is related to highway safety. Suppose a state width limitation of eight feet is challenged under the Commerce Clause by a party who wishes to operate a vehicle eight feet, three inches wide. A federal court would not, prior to characterizing the width regulation as a safety regulation, pause to consider whether three additional inches would seriously increase the danger. Similarly, if a 50 miles per hour speed limit were challenged by a party who claimed an economic need to proceed at 54, a court would not, before treating the speed limit as a safety measure, inquire whether four miles per hour is demonstrably critical in preventing accidents. Thus, although the particulars of the statute may be challenged as irrational, for purposes of the threshold question of whether the statute should be characterized as a safety regulation, a federal court should inquire only whether the length of vehicles is generally related to safety.

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[3] As noted *supra* at 3, the Iowa legislature recently increased the limit for semis to 60 feet.

Although this methodological issue has not been discussed overtly in the decisions of this Court, the practice has been precisely that for which Iowa contends. For example, in *Ray* v. *Atlantic Richfield Co.*, 435 U.S. 151, 186 (concurring opinion), the question addressed was the general relationship between oil tanker size and state concerns for safety and the environment. In *Firemen*, this Court plainly focussed upon whether imposing a minimum crew size advanced railway safety and not upon whether four crewmen could operate a train as safely as five. 393 U.S. at 130, 133-136. In *Southern Pacific Co.* v. *Arizona*, 321 U.S. 761, 775-76 (1945), the lack of a general relationship between train length and safety was fatal to the Arizona statute. The problem was not that the limit imposed was five cars too short. And, in *South Carolina State Highway Dep't.* v. *Barnwell Bros., Inc.*, 303 U.S. 177, 190-91 (1938), this Court addressed the general relationships between vehicle width and safety and between vehicle weight and safety. Justice Stone specifically disavowed a judicial role in evaluating the comparative utility of marginally different restrictions.

The courts below not only posed the issue too narrowly, but they also misperceived the nature of the inquiry. The question of whether the length of vehicles is related to their safety is a question of fact, but it is a question of legislative fact rather than adjudicative fact:

> Adjudicative facts usually answer the question of who did what, where, when, how, why, with what motive or intent; adjudicative facts are roughly the kind of facts that go to a jury in a jury case. Legislative facts do not usually concern the immediate parties but are the general facts which help the tribunal decide questions of law and policy and discretion.

K. Davis, *Administrative Law Text*, § 7.03, at 160 (3d ed. 1972).

This distinction is important to the nature of the inquiry here. Legislative facts are generally important in resolving constitutional issues and are often critical in dormant Commerce Clause litigation. *Raymond* at 447-48, n.25. See also Bikle, *Judicial Determination of Questions of Fact Affecting the Constitutional Validity of Legislative Action*, 38 Harv.L.Rev. 6, 9-10 (1924); Karst, *Legislative Facts in Constitutional Litigation*, 1960 Sup. Ct. Rev. 75, 78.

Legislative facts may be supplied by judicial notice, by evidence in the record or by factual material supplied in a legal brief (the "Brandeis Brief"). Karst, *supra* at 99-100. Scrutiny of legislative facts is essential in determining whether a statute is rationally related to a legitimate governmental objective. Alfange, *The Relevance of Legislative Facts in Constitutional Law*, 114 U.Pa.L.Rev. 637, 668 (1966). That inquiry is usually framed in terms of whether a rational legislature could believe that x is related to y. That is the basic question here. Iowa's interest in the length limitation should be characterized as a safety interest for Commerce Clause balancing purposes if a rational legislature could believe that the safety of vehicles is affected by their length.

B. The Presumption of Constitutionality Provides the Standard of Review for Determination of Disputed Questions of Legislative Fact.

The courts below, in part because they failed to distinguish between adjudicative and legislative facts and in part because they misread *Raymond*, failed to provide Iowa with the proper benefit from the presumption of constitutionality. Legislative facts are frequently complex, built upon an intricate structure of data and inferences. Karst, *supra* at 100. General relationships among variables lies within the realm of prediction and probability. *Id.* at 99. Courts frequently will find themselves with less than perfect information concerning a critical proposition of legislative fact. Because the question ordinarily must be resolved, a court must either proceed by judicial notice or by allocating the risk of nonpersuasion (burden of proof).

This Court in *Raymond* made clear that it would no longer proceed, in the face of some record evidence, to utilize judicial notice to resolve legislative fact questions concerning vehicle size regulation. 434 U.S. at 444-45, n.19. Put differently, this Court will no longer use the presumption of constitutionality as a total substitute for legislative facts in support of a proposition when substantial evidence has been produced challenging the proposition. However, this Court made clear that a strong presumption of constitutionality continues to attach to size restrictions. *Id.* The effect of the presumption of constitutionality in this context is to place a heavy burden of persuasion on the party contending that length is unrelated to safety:

> It is hardly necessary to recall the rule that legislation comes to the Court with the presumption in favor of its constitutional validity. Clearly, therefore, the litigant who challenges this validity may properly be required to satisfy the Court of the correctness of his position in point of fact. This, it

> is submitted, he should do in such a way as to furnish a foundation *of record* for the Court's determination if it is to be in his favor.

Bikle, *supra* at 21. (Footnote omitted, emphasis added).

A "clear and convincing evidence" standard should be used to evaluate the evidence offered by the party challenging this statute:

> If the presumption of constitutionality is applied to the facts presented at trial supporting constitutionality, the litigant asserting the contrary must carry the burden of rebutting that presumption. In rebutting, this party should at least be required to meet a preponderance of the evidence standard. However, when the state asserts safety or an equally vital interest, opposing litigants should be held to a 'clear and convincing evidence' standard in rebutting the presumption of constitutionality.

Comment, *The Role of Constitutional Facts in Commerce Clause Litigation*, 65 IowaL.Rev. 1053, 1070 (1980) (footnotes omitted).

Justice Stone's statement in *South Carolina State Highway Department* v. *Barnwell Bros.*, 303 U.S. 177, 191 (1938), eloquently expresses that view:

> Since the adoption of one weight or width regulation, rather than another, is a legislative and not a judicial choice, its constitutionality is not to be determined by weighing in the judicial scales the merits of the legislative choice and rejecting it if the weight of evidence presented in court appears to favor a different standard . . . . Being a legislative judgment, *it is presumed to be supported by facts known to the legislature unless facts judicially known or provided preclude that possibility.* Hence, in reviewing the present determination *we examine the record, not to see whether the findings of the court below are supported by evidence, but to ascertain upon the whole record whether it is possible to say*

> *that the legislative choice is without rational basis.* (Emphasis added).[4]

Raymond clearly continues this view with the statement that a safety justification need only be "colorable," 434 U.S. at 444, or "not illusory." 434 U.S. at 449 (concurring opinion).

Weighty policy reasons support the employment of a strong presumption of constitutionality in assessing the nature or character of a state's interest in a regulation. Separation of powers principles suggest a primary role for the elected branch of government in the complex cost-benefit assessments involved in modern transportation regulation. Principles of federalism have traditionally supported a primary role for state policymaking on health and safety matters, absent Congressional preemption. In addition to allocating the burden of persuasion based on policy considerations, courts also allocate the burden based upon judicial estimates of probabilities. *McCormick on Evidence,* § 337 at 786-87 (2d ed. 1972). Experience indicates that if a legislature retains a regulation for many years and provides public funds to enforce it, seldom will it subsequently appear that the regulation lacked a rational basis.

Because of a misreading of *Raymond,* the courts below not only asked the wrong question but also failed to give Iowa the benefit of a presumption of constitutionality. In *Raymond,* Wisconsin urged that their regulation should prevail if, without more, it bore a rational relation to highway safety. This Court rejected that claim, properly holding that even were a rational relationship shown, it would still be necessary for a federal court to address a further question, namely whether the burden on commerce clearly outweighs putative safety benefits. The latter question plainly compels a balancing of competing interests.

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[4] This passage also makes clear that the Court of Appeals should not have applied the clearly erroneous standard of appellate review that Rule 52, Fed.R.Civ.P., ordinarily dictates for adjudicative facts. Applying the presumption of constitutionality, the appellate court should examine the entire record to determine whether the challenger has demonstrated that the state has no colorable rational basis for the claim that a regulation advances safety.

The courts below mistook this rejection of Wisconsin's ultimate claim as an invitation to federal courts to sit as highway safety examiners and to make de novo determinations, by a mere preponderance of the evidence and reviewed only under the clearly erroneous standard, of the preliminary legislative fact question of whether a highway regulation advances safety. But *Raymond* neither rejected the presumption of constitutionality nor the teaching of *Firemen* that, in the guise of finding facts, a federal court should not resolve conflicting evidence in an area of scientific uncertainty to reject a reasonable policy judgment by a legislative body.

In an era of rapidly advancing technology, and related threats to public safety, government frequently must decide whether to regulate before scientists have demonstrated to a professional certainty that, say, a new chemical is or is not safe in certain applications. If the approach of the courts below were applied to the many objects in and instrumentalities of interstate commerce, numerous regulations enacted for reasons of safety, but whose precise relationship to safety cannot be scientifically demonstrated, would be placed in constitutional jeopardy.

C. Absent a Showing of Discriminating Purpose or Effect, The Selection of Different Length Limitations for Different Classes of Vehicles Does Not Weaken the Presumption of Constitutionality.

In *Raymond*, this Court placed some weight on the great number of statutory and administrative exceptions to Wisconsin's permit requirement for combinations of more than two vehicles and its length limitation of 55 feet. Their sheer number was felt to undercut the claim the "the general limitation" was designed to promote safety. 434 U.S. at 445. Moreover, this Court found that one of the exceptions discriminated on its face in favor of Wisconsin industries, *id.* at 446, and that a number of other exceptions were "enacted at the instance of, and, primarily benefit, important Wisconsin industries." *Id.* at 447. Such exceptions "weaken the presumption in favor of the validity of the general limit, because they undermine the assumption that the State's own political processes will act as a check on local regulations that unduly burden interstate commerce." *Id.* A cross-reference was made to footnote 18, explaining the special deference traditionally afforded state highway regulations in part by reference to Justice Stone's theory that, so long as state regulations affect local and interstate interests alike, the political processes may be and should be relied upon to check excessively burdensome regulations. *Id.* at 444.

Comparable objections cannot fairly be made to the Iowa length limitations. The record does not suggest that the exceptions swallow the rule or that they reflect "economic protectionism." Cf. *Lewis* v. *BT Investment Managers, Inc.*, —— U.S. —— (filed June 9, 1980), 48 U.S.L.W. 4638. Indeed, it might foster clarity not to speak of "exceptions." Iowa limits the length of all vehicles for reasons of safety. The particular length permitted varies with such factors as the number of axles, the configuration of the vehicle, the expected frequency of the vehicle's operation, the geographic location of the vehicle's operation, the practices of other states and the physical characteristics of the load. Like many regulatory decisions, these length limitations appear to reflect a complex legislative balancing of numerous variables.

The most pertinent limitations are as follows:

1. Single trucks and busses: 40 feet. §§ 321.457(1) and (2).
2. Truck tractor, semitrailer combinations: 55 feet. § 321.457(3).
3. Mobil homes drawn by motor vehicles: 60 feet. § 321.457(4).
4. Vehicle carriers: 60 feet plus five feet total overhang beyond the bumpers. § 321.457(5).
5. Combinations of three vehicles (doubles): 60 feet. § 321.457(6).
6. Semitrailers transporting livestock: 60 feet. § 321.457(3).
7. Vehicles operating in "border cities" which have adopted ordinances borrowing size limitations of abutting state. Indeterminate. § 321.457(7).

Nothing about this pattern of limitation appears to favor local trucking interests over interstate interests or otherwise overtly to discriminate against interstate interests. The District Court expressly so found (JS at 31a), although Judge Stuart did opine that the vehicle carrier limit weakens the claim that length of vehicles is related to safety (JS at 30a).

The Eighth Circuit, without reference to the District Court's express finding that the limitations were nondiscriminatory, without reference to the record, and without any significant analysis, found that the "cumulative effect" of exceptions from the general limitation represent a compromise between forces within the state that seek to retain the general limit and industries which object to the limit and concluded "they reduce our willingness to assume that the state's own political process serves as a check on burdensome regulations." (JS at 11a).

The Court of Appeals first referred to the provision for border cities and asserted: "(t)his exception, *of course*, works to mitigate the local hardships imposed by the general prohibition." *Id.* (Emphasis added). There is no evidence in the record that the 60-foot limitation creates a *hardship* to Iowa consumers or manufacturers in border cities or elsewhere, or that the municipal lobby was in some manner persuaded to withdraw its support for 65-foot doubles by the enactment of the border city proviison. If a court is to proceed here by intuition, it is equally plausible to infer the benign motive of accommodating interstate shippers in overlength vehicles. An interstate shipper with a border city destination can avoid reloading without generating the safety concerns associated with the general use of longer vehicles on Iowa's highways.

In *Sproles* v. *Binford*, this Court upheld an exception to a weight limitation for "implements of husbandry," stating:

> We think that the exception, in light of the context and of its apparent purpose, instead of being arbitrary relieves the limitation of an application which otherwise might itself be considered to be unreasonable with respect to the exceptional movements described.

286 U.S. 374, 392.

The Iowa legislature, whose role generally requires it to make classifications, decided to treat different situations differently. The District Court found the border city provision to be rational and nondiscriminatory. (JS at 29a). It remains unclear how this legislative classification helps to justify a highly unusual judicial decision to create an additional "exception" to Iowa's general length limitation, *to wit*: the "65-foot doubles on the interstate" exception.

Next, the Court of Appeals referred to the limitation for vehicle carriers and stated that it "eases the burden of the general limitation on Iowa consumers and its agricultural community. . . ." This statement is difficult to interpret. Apparently, the court is not suggesting that the vehicle carrier limitation was intended to subsidize unspecified manufacturers of vehicles or that there is a local trucking industry specializing in this market. Nor does it seem likely the court is suggesting that Iowa consumers would be *unable* to purchase these various vehicles without the exception. Perhaps the suggestion is that this exception lowers the cost of the vehicles. However, the record provides no support for that suggestion, much less any basis for determining the amount of any cost increase. If a court is to proceed by intuition, it is equally reasonable to suppose that the legislature was adjusting for the *comparative indivisibility* of the cargo carried by vehicle carriers and that the differing treatment is grounded in physical rather than economic reasons. See A. 198; cf. *Raymond*, n.5 at 433-34.

Third, the Court of Appeals commented upon the provision permitting livestock to be transported in 60-foot semis: "this exception is of undoubted assistance to Iowa's agricultural interests." (JS at 11a). Perhaps so. But livestock trucks are not permitted to operate longer than the general limit of 60 feet, which is also applicable to doubles. Again, it is not obvious how the existence of this classification reduces the possibility that the general limit will be increased to 65 feet.

In short, there is nothing in these "exceptions" to warrant the inference that interstate trucking interests are not fairly represented in the Iowa legislature by virtue of their common ground with shippers, intrastate trucking interests, and interstate trucking interests based in Iowa. If one is to adopt a cynical explanation for the "exceptions," a suggestion more realistic than that of the Court of Appeals is that the exceptions are the "thin edge of the wedge" in the trucking industry's campaign for larger vehicles.

A recent commentator on the dormant Commerce Clause is sympathetic to the general proposition that this Court should apply a more stringent standard of review if it appears a challenged provision disadvantages interests unlikely to be fairly represented in the political process. Tushnet, *Rethinking the Dormant Commerce Clause*, 1979 Wis.L.Rev. 125. However, Prof. Tushnet argues that exemptions from length limitations are relevant to commerce clause issues only if they are discriminatory. *Id.* at 158. And, he suggests that if a court purports to consider alleged distortions affecting interests other than the directly regulated industry (in this case, trucking), it will soon uncover an inquiry so elusive as to be quite indeterminate. *Id.* at 160.

His suggestion seems borne out by analysis of the Court of Appeals treatment of the "exceptions" outlined above. CF has not shown that some local economic interest is skillfully precluding the formation of a majority for increasing length limitations. To the extent the record is helpful on this point, it indicates that a majority for longer trucks has been mustered in the Iowa legislature on two separate occasions (A. 420) and that, at least at one time, a majority of Iowans favored the increase. (Plaintiff's Exhibit #2, *Sixty Five Foot Twin Trailers on Iowa Highways* at 70). The record also tends to suggest that the principal opponents of increasing length have been the Motor Club of Iowa (AAA) (A. 500), the Des Moines Register and Iowa's five-term Governor, Robert D. Ray (A. 171-185). In no case is this opposition traceable to an economic special interest. In *Raymond*, there was some evidence that the political process was not working well in relation to double-bottom trucks. Here, CF has shown no more than that, to this point, it has lost a fair political fight.

This Court in *Raymond* reaffirmed the proposition that nondiscriminatory exceptions do not make a size limitation suspect:

> Neither do we intimate that nondiscriminatory exceptions to general length, width or weight limits are

> inherently suspect. Cf. *Sproles* v. *Binford*, 286 U.S. 374, 391-396 (1932).

434 U.S. at 446-47, n.24.

The District Court found that the "exceptions" were not discriminatory. The Court of Appeals, despite applying the "clearly erroneous" standard to the District Court's other findings, apparently found the exceptions at least somewhat discriminatory. But the Court of Appeals pointed to none of the evidence usually required for a finding of purposeful discrimination:

> Three sources may be used to establish such a conclusion: (1) the different practical or statistical impact upon differing classifications of persons; (2) the general history concerning the problems which the legislative or administrative rule seeks to solve; (3) the history of the passage or enactment of the legislation or agency rule.

J. Nowak, R. Rotunda & J. Young, *Constitutional Law* at 531 (West 1978), citing to *Arlington Heights* v. *Metropolitan Housing Development Corp.*, 429 U.S. 252-266-68 (1977).

In the absence of evidence of discriminatory purpose, the Court of Appeals embarked upon a psychoanalytic inquiry into legislative "motive," the undesirability of which has long been recognized. See A. Bickel, *The Least Dangerous Branch*, 208-221 (1962).

Speculation that legislative motives are improper is undesirable because it is tantamount to an accusation that the decision maker violated the oath of office; it attacks the decision maker's honesty and integrity. See Brest, *Palmer* v. *Thompson: An Approach to the Problem of Unconstitutional Legislative Motive*, 1971 Sup.Ct.Rev. 95, 129-30. In short, unsupported accusations of improper legislative motive flout some of the very values the presumption of constitutionality exists to promote. Iowa does not contend that evidence of discrimination may not appropriately be considered in this context; Iowa does contend that CF has not shown that Iowa need apologize for the working of its political process. There should be no weakening of the presumption here.

D. CF Did Not Establish By Clear and Convincing Evidence That Length Is Unrelated to Safety.

CF has not accepted, and indeed was not required by the courts below to accept, the burden of establishing by clear and convincing evidence that length is unrelated to safety. CF introduced virtually no evidence directly tending to establish that it is irrational to limit the length of trucks. CF's showing on this issue would not rebut the presumption of constitutionality sufficiently to require evidence from the state in support of the presumed fact. Nonetheless, Iowa did produce evidence supporting the relationship between lentgh and safety.

The record reflects that *every* state limits the length of vehicles and, indeed, that the vast majority of states set the limits for combinations of vehicles within the narrow range from 55 to 65 feet. The record also reflects that the American Association of State Highway and Transportation Officials (AASHTO) has long recommended *length* limitations, along with other size and weight limitations, for all classes of large vehicles. (A. 645.).

This Court has long relied upon the collective judgment of other public officials in determining whether a state legislature may rationally believe one variable is related to another. For example, in determining that wage rates were related to the health of women, this Court stated in *West Coast Hotel Co.* v. *Parrish,* 300 U.S. 379, 399 (1937):

> The legislature had the right to consider that its minimum wage requirements would be an important aid in carrying out its policy of protection. *The adoption of similar requirements by many States*

> *evidences a deep-seated conviction both as to the presence of the evil and as to the means adapted to check it.* Legislative response to that conviction cannot be regarded as arbitrary or capricious and that is all we have to decide. Even if the wisdom of the policy be regarded as debatable and its effects uncertain, still the legislature is entitled to its judgment. (Emphasis added.)

Iowa also produced evidence of particular correlations between length and safety. Professor Leo Peters of Iowa State University made calculations concerning increased passing time and distance required to pass different length vehicles traveling at different speeds. He noted that, in climates such as Iowa's, passing maneuvers on interstate highways can occur in conditions of rain, sleet, ice, and snow. These conditions create splash and spray and snow blowout that create visibility hazards. The longer the truck, testified Peters, the greater the visibility problem. (A. 505). CF concedes that the fraction of a second longer required to pass a vehicle can be a critical factor in the occurrence of an accident. (Factual Statement and Responses, #141 at 150).

Transportation Engineer Robert Carstens, a professor of engineering at Iowa State, directed a study uniquely designed to indicate mathematically with field data the effect of a change in length from 60 to 65-foot doubles. The study involved maneuvers that occur at intersections, and focused on right-angle collisions. The conclusion of Dr. Carstens was that the inescapable result of an increase in vehicle length is an expectation of an increase in intersectional accidents because of the type of maneuvers that such vehicles make in entering, crossing and diverging from a traffic stream. A 65-foot double encroaches more upon opposing traffic lanes than a 60-foot double because encroachment is directly related to length. This increased exposure contributes to more accidents. This expectation of an increase in accidents would occur at every intermediate stop for picking up trailers, changing of drivers, eating or refueling as well as every intermediate stop that would occur in vehicles going to and from the interstate system. (A. 457). As truck lengths approach 85 feet or 108 feet, this concern would increase accordingly.

Colonel Edward Dickinson, Chief of the Iowa Highway Patrol, expressed concern that longer vehicles have the potential to cause blockage at the scene of an accident because they may be difficult to back more than a few feet. (A. 399-400).

CF has stated: "As a general proposition, Appellee will concede that length may relate to safety, but the connection is not simple, and limiting length does not necessarily promote safety." Motion to Affirm at 15. Iowa has not suggested that the relationship is either simple or completely understood. Indeed, we have pointed out that the Federal Highway Administration is in the midst of a massive study known as Project No. 1-U, which is evaluating increasing truck sizes and weights in terms of, *inter alia*:

(a) accident experience,

(b) impact on traffic operations,

(c) handling properties of trucks,

(d) behavior and attitude of drivers in the vicinity of large trucks,

(e) aerodynamic properties, including "splash and spray" effect on other vehicles,

(f) brakes failing on downhill grades, and

(g) corrective research to satisfy safety problems.

A. 202-203.

Iowa contends neither that vehicle length is the most important determinant of vehicle safety nor that the nature and extent of the relationship is perfectly understood. Iowa *does* contend that its legislature is entitled to place reasonable limits on vehicle length. CF has certainly not established by clear and convincing evidence that length is unrelated to safety.

As previously noted, the court below did not address this issue directly, apparently because they accepted the issue tendered by CF: whether 65-foot doubles are as safe as 55-foot semis. CF produced voluminous evidence on this point, their entire case in *Raymond* plus some additional studies and experts. Iowa vigorously disputed CF's claim that it was a demonstrable scientific fact that doubles are as safe as semis. Iowa challenged the foundation provided the expert witnesses and pointed out serious problems with the statistical studies. Reliability of the underlying data plagues all of the studies, including those offered by Iowa. (Transcript at 395). Sample size is frequently a problem. (A. 475-476). Several studies, including the Bureau of Motor Carrier Safety study showcased in *Raymond*, were shown to be seriously flawed because critical variables were not controlled. (A. 469). *None* of the studies offered by either side provide statistically significant conclusions on any ultimate issues arguably relevant to this litigation. The District Court so found. (JS at 21a). The District Court also found that doubles are more prone to jackknife and upset than semis. *Id.* Cf. *Raymond* at 436.

Thus, Iowa did and does dispute that doubles have been scientifically proven as safe as semis. We do concede that the *available* evidence does not indicate any gross differences in safety between doubles and semis. However, we vigorously deny that this proposition concerning *configuration* poses a threat to Iowa's 60-foot limitation on doubles, which excludes CF's preferred vehicles solely on the basis of *length*.[5]

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[5] Dr. John C. Glennon, CF's leading safety expert, testified that the various studies presented by CF revealed nothing about the comparative safety of 60-foot and 65-foot doubles. (A. 578).

Although we submit that the courts below misperceived the nature of the issue and applied an erroneous mode of analysis, we also submit that the District Court's call for federal preemption implies a finding that length is related to safety:

> The Court is not particularly comfortable with this result. The long established reluctance of the courts to interfere with State policy on the weight, width and length of vehicles permitted on its highways is being eroded. The public policy of the State of Iowa has been that it is for the best interest of its citizens to limit the length of twins to 60 feet. The public policy of the surrounding states for reasons known to them raised the limit to 65 feet. Apparently they made a policy decision that the advantages of permitting twins outweighed the disadvantages. Here, the Interstate Commerce Clause is being used to force Iowa to abandon its chosen public policy. The trucking industry has long played leap frog with weight and length limitations to achieve alternate increases. Truckers that haul products that "cube out" before they "weigh out" ask for an increase in length of a few feet so they can take advantage of the weight limit. Then those truckers that haul products that "weigh out" before they "cube out" ask for weight increases so they can utilize the additional length. It is not difficult to establish that the small increase in weight or length creates no additional safety hazard or damage to highways. With some officials saying 108-foot triple-bottoms impose no additional safety hazard on interstates, there appears to be no end in sight.
>
> If this concern points to anything of particular significance, it is that the interstates should be treated differently than other highways. Regulations regarding the length, width and weight of vehicles using the interstate system should be uniform. Congress should pre-empt this area of the law and set these standards.

JS at 27a-28a.

If the court had found no reason to fear 108-foot triple bottoms, it would not call for preemption; the court would not call for Congress to act upon an irrational premise.

The courts below erred because of a misreading of *Raymond.* Iowa has consistently contended that a concurring opinion in *Ray* v. *Atlantic Richfield Co.*, 435 U.S. 151 (1978), decided subsequently to *Raymond,* helped to illuminate the nature and proper resolution of the issues in this case:

> Appellees have not demonstrated that the Tanker Law's size limit is an irrational or ineffective means of promoting safety and environmental protection, . . . The stipulation quoted by the Court, ante, at 176 n. 27, 55 L.Ed.2d, at 200, merely establishes that there is good-faith dispute as to whether exclusion of large tankers will in fact reduce the risk of oil spillage in Puget Sound. A showing that there is conflicting evidence is not sufficient to undercut the presumption that a State's police power has been exercised in a rational manner. See, e.g., *Firemen* v. *Chicago, R.I. & P.R. Co.*, 393 U.S. 129, 138-193, 21 L.Ed.2d 289, 89 S.Ct. 323 (1968).

435 U.S. at 186-87.

Because CF has not demonstrated that the length of vehicles is unrelated to their safety, safety should be included among the local interests to be weighed against the alleged burden on interstate commerce.

II. IOWA'S 60-FOOT LIMITATION FOR DOUBLE TRAILERS IS NOT CONSTITUTIONALLY UNREASONABLE.

As previously noted, the central thrust of CF's trial presentation consisted of an examination of the comparative safety of 55-foot semis and 65-foot twins. Although we contend above that this evidence is essentially irrelevant to the broader question of whether § 321.457 may fairly be characterized as a safety statute, we do not dispute CF's entitlement to challenge the rationality of the classifications employed in the statute. Properly stated, the issue is whether Iowa has been irrational in limiting twin-trailers to 60 feet in view of the 55-foot limitation for semis. Ordinarily this would be regarded as a Due Process or Equal Protection rather than a Commerce Clause inquiry, but the question should be addressed under one label or another.

The *general range* within which the limitations have been set cannot be regarded as unreasonable. Iowa's limitations for semis and doubles were adopted in 1963 and reflected the then-existing standards of the American Association of State Highway and Transportation Officials (AASHTO). AASHTO subsequently increased its standard for twin-trailers to 65 feet. A majority of states have now adopted that change; Iowa and at least 17 other states, to this point, have not (A. 645). As late as December 31, 1978, AASHTO data indicated 25 of 52 reporting jurisdictions limited doubles to less than 65 feet or refused to permit them at all (A. 645). Thus, Iowa can scarcely be said to be a constitutional "outrider" in its general approach to length limitation. Cf. *Bibb* v. *Navajo Freight Lines*, 359 U.S. 520 (1959) (striking new Illinois requirement of a type of mudguard incompatible with those required in other states).

Nor is it irrational for Iowa to permit CF to operate doubles only five feet longer than semis, rather than the additional ten feet they would prefer. This case is different from *Raymond, inter alia,* because of the different statutory treatment of doubles. Wisconsin disadvantaged doubles compared to semis, apparently because of their configuration, *Raymond* at 432-33; Iowa *advantages* doubles compared to semis, apparently because of their configuration. Sixty-five foot doubles are excluded from Iowa highways, not because of their configuration, but because they are too long. Put differently, CF cannot claim that Iowa discriminates against the type of vehicles which it prefers to operate. CF can only complain that

Iowa has a shorter limit for doubles than obtains in some other states.

Unlike in *Raymond*, the issue here becomes one of legislative line drawing. Virtually whenever a numerical line is drawn, whether it be in terms of time, distance, weight, speed, etc., the particular number chosen will be somewhat arbitrary in comparison with another closely adjacent number. Justice Holmes' statement is classic:

> When a legal distinction is determined, as no one doubts that it may be, between night and day, childhood and maturity, or any other extremes, a point has to be fixed or a line has to be drawn, or gradually picked out by successive decisions, to mark where the change takes place. Looked at by itself without regard to the necessity behind it the line or point seems arbitrary. It might as well or nearly as well be a little more to one side or the other. But when it is seen that a line or point there must be, and that there is no mathematical or logical way of fixing it precisely, the decision of the Legislature must be accepted unless we can say that is very wide of any reasonable mark.

Louisville Gas & Electric Co. v. *Coleman*, 277 U.S. 32, 41 (1938) (dissenting opinion). See also *Massachusetts Bd. of Retirement* v. *Murgia*, 427 U.S. 307, 314-16 (1976); *Mathews* v. *Diaz*, 426 U.S. 67, 82-84 (1976).

Iowa cannot produce statistical studies demonstrating conclusively that a 60-foot double is safer than a 65-foot double. CF's own expert acknowledges that five feet of length will not appear to be statistically significant, but states that ten feet likely is significant. (A. 71). Moreover, few dispute that Iowa is reasonable in declining to permit *85-foot* doubles. A suit seeking to require a twenty-five foot increase in length would seem doomed to failure; five suits, each involving the question of whether five feet in length makes a safety difference, cannot be permitted to achieve indirectly what one suit could not obtain directly.

III. THE CLAIMED BURDENS ON INTERSTATE COMMERCE ARE NEITHER SUBSTANTIAL NOR FAIRLY ATTRIBUTABLE TO IOWA'S LENGTH LIMITATIONS.

Before analyzing the burden issue, it may be helpful to note what is not involved in this case. There is no claim here that the flow of real goods is actually impeded; whatever the effect may be on carriers, the length limitation does not deny shippers access to them. There is no showing that the length limitation advantages intrastate over interstate carriers, nor any showing that it advantages interstate carriers based in Iowa over those based elsewhere. This Court "consistently has distinguished between outright protectionism and more indirect burdens on the free flow of trade." *Lewis* v. *BT Investment Managers, Inc.*, —— U.S. ——, filed June 9, 1980, 48 L.W. 4638, 4640. The burden here, if any, is extremely indirect and cannot be characterized as "economic protectionism."

Iowa submits that the only fair measure of any burden on interstate commerce here is any difference in efficiency between an optimally organized system employing 60-foot doubles and a system employing 65-foot doubles. That is the proper measure because that is the difference between what CF may do with the limitation in place and what they seek to accomplish by this litigation. Moreover, CF must establish a linkage between effects on operating costs and rates charged shippers. It is interstate commerce and not trucking industry profits which is constitutionally protected.

Iowa does not dispute that a truck which will carry more cubic feet of cargo is *potentially* more efficient on a cost-per-mile basis than a smaller vehicle. In this limited sense, a 65-foot double, which has approximately 10% greater cubic capacity, is potentially more efficient than a 60-foot double. In this limited sense, a 108-foot triple, operated by CF in some parts of the United States (A. 365-366), has a greater potential efficiency. Cubic capacity could also be increased significantly by increasing the permissible width of trailers by twelve inches. The cubic capacity of a freight train, of course, dwarfs that of even the largest motor carrier. Obviously, increasing cubic capacity is not invariably and indefinitely efficient or otherwise socially desirable.

Whether the potential efficiency of increased cubic capacity is ever realized in actual operation may depend upon many variables,[6] one of which is whether the increased cubic capacity is fully utilized. This does not always occur in the trucking industry, as is illustrated by the evidence that CF will use small straight trucks in certain urban areas and a double tractor with a single trailer in other areas. (A. 353). Bigger is not more efficient for all purposes: a Boeing 747 aircraft is generally not used for short flights or even long flights to obscure destinations.

CF has operated a type of 60-foot double in Iowa, but has never operated an optimally organized system throughout the nation or the Midwest using the vehicles legal in Iowa. For that reason, they have no actual experience upon which to base a meaningful comparison. The record thus does not provide a precise and reliable estimate of the extent, if any, to which the potential inefficiency actually is translated into a net deficit.

There are several extrinsic reasons to believe any net deficit is not very great. Roadway, Inc., one of CF's major competitors, has determined not to use doubles at all, but competes effectively with CF nationally and in Iowa as a major carrier of general commodities. (A. 237; 377-378). CF also concedes that its Iowa business has expanded in recent years, Iowa's length limitation notwithstanding. (A. 366). And, CF is expanding its operation in the southeastern states, in which it may operate neither 65-foot nor 60-foot doubles. (A. 372-374).

---

[6] Other obvious variables include accident rates, maintenance costs, and fuel consumption.

CF has deemphasized the only fair approach to assessing the claimed burden and rather has attempted to attribute to Iowa the estimated actual costs it has experienced as a result of its voluntary business decision to direct much of its traffic, semitrailer as well as 65-foot double, through Missouri rather than Iowa. The courts below accepted CF's claim that Iowa's length limitation "caused" this "diversion." That claim is as unfair as it is inaccurate.

Iowa has limited doubles to 60 feet since 1963, at which time the AASHTO standard was also 60 feet. CF may operate 60-foot doubles as well as semis in any state where it may legally operate 65-foot doubles. Had CF elected to acquire 60-foot doubles, *i.e.* to make that vehicle the "industry standard," it could direct its traffic over the routes of its choosing. Traditional legal concepts of attributing causation stress the significance of voluntary human conduct as a superceding cause. See H. Hart & A. Honoré, *Causation in the Law* at 129-34 (1959). That voluntary conduct here was CF's decision to employ large quantities of 65-foot doubles with full knowledge that they could not be operated in a significant number of states. Accepting CF's attribution of causation effectively permits the trucking industry and states on two sides to preempt a reasonable state policy. Heretofore only Congress has been conceded that authority:

> . . . the states may act within their respective jurisdictions until Congress sees fit to act . . . . As this principle maintains essential local authority to meet local needs, it follows that one state cannot establish standards which would derogate from the equal power of other states to make regulations of their own.

Sproles v. *Binford*, 286 U.S. 374, 390 (1932).

Justice Stone elaborated on this point in *South Carolina State Highway Dept.* v. *Barnwell Bros.*, 303 U.S. 177, 195-96 (1938):

> It would hardly be contended that if all the states had adopted a single standard none, in the light of its own experience and in the exercise of its judgment upon all the complex elements which enter into the problem, could change it.

The flaw in CF's attribution may further be exposed by considering two hypotheticals. Suppose Iowa had never constructed any interstate highways, that it had declined the federal contribution, as it was legally free to do. That decision would as effectively "divert" CF's 65-foot twins as a length limitation. Would a federal court order Iowa to construct Interstate 80? Or suppose Missouri had declined to increase its length limitation to 65 feet as it was free to do, at least until the decisions of the courts below. Iowa would have behaved exactly as it has, but it could not then be suggested that Iowa caused a diversion through Missouri.

It is now clear that this case, contrary to the way *Raymond* was argued and decided, involves the fate of length limitations across the entire nation. The record reflects that most eastern and southeastern states do not permit 65-foot doubles to operate on their highways. (A. 605). Focussing on that fact lays bare one of the reasons the "burden" analysis of the courts below is unsound. Iowa is alone in permitting only 60-foot doubles in an area of the county where 65-foot doubles are generally permitted. CF's burden analysis depends upon that fact for the argument that Iowa "causes" CF to "divert" its equipment through other states. No such claim has been or could be made for the East and Southeast and CF is expanding into that area, with *semitrailers*. These facts reveal that CF's burden argument based upon diversion is a bootstrap grounded in their voluntary business decisions and the recent legislative decisions of other midwestern states. It cannot be the law that the Constitution requires Iowa, with its hazardous winters, to permit long trucks, while states with mild southeastern climates may limit truck length. A burden analysis which produces absurd results must be reexamined.

Unlike the situation in *Raymond*, then, it is not appropriate to attribute any shipping *delays* CF may experience to Iowa's length limitation. CF may take advantage of any claimed economies associated with the double configuration and may run doubles on the route of its choice. Wisconsin only permitted semis and it was thus not unfair in *Raymond* to attribute delays and diversions of doubles to their policy.

However, even if one were to accept, *arguendo*, CF's claim that the burden should be measured by the costs associated with diverting traffic through Missouri, we are dealing here with an essentially *de minimis* impact on the nation's shippers. Iowa's expert economist, Professor Thomas Pogue, placed these costs in useful perspective:

> I really wanted to address the question of the quantitative significance of the costs that CF says are associated with this limitation, pretty much taking their estimate of their costs as given, with a few reservations, and what I have tried to do is, I think, to show that in comparison to other costs, these are small. In comparison to other cost increases that CF confronts and other similar carriers confront each year, these costs are small.
>
> I have been concerned about the fact that the impact on costs associated with the ban, as estimated by CF, has not been translated into a quantitative estimate of the impact on rates, and I see this as a key linkage that needs to be spelled out; and in my own very uninstructive way I have tried to get some feel for what that magnitude might be in the absence of

> seeing any estimates in the testimony of CF, and that was my purpose in trying to work though the implications for average rates of passing on the full cost savings that CF would enjoy by its estimates to its customers, and that again was a small percentage, less than one-third of one per cent, so looked at either from the perspective of effects on costs, it is small, or the prospective or potential effect on rates, it appears to be small.

A. 547-548.

More specifically, Prof. Pogue testified that CF's claimed burden of $2 million is only .336 of one per cent of CF's Total Operating Costs of $546,000,000. (A. 543). He compared this with the average wage increase of 8.1% per year and the average fuel cost increase of 24% per year over the period from 1972-77. (A. 544-545). Prof. Pogue expressed the opinion that the demand for motor carrier service is sufficiently price inelastic that it was unlikely that any rate increase attributable to the length limitation would be noticed by shippers in deciding whether to utilize motor carrier services. (Transcript at 1993-94).

CF's own witness, Mr. Andrew Happer of the Middlewest Motor Freight Bureau, testified that he had made no attempt to calculate the effect of CF's claimed burden on shipping rates, but that the effect would not be of great magnitude. (A. 166). Indeed, Happer admitted that the $2 million was of approximately the same magnitude as the standard error involved in the random sampling procedure upon which the rate calculations are based. (A. 165).

Thus, even were it fair to attribute to Iowa's length limitation a burden in the amount calculated by CF, that burden would be insubstantial in light of this Court's most recent discussion of burden magnitudes. In concluding that a tug escort requirement did not burden interstate commerce, the majority in *Ray* v. *Atlantic Richfield Co.*, 435 U.S. 151, 179 (1979), stated:

> Nor does it appear from the record that the requirement impedes the free and efficient flow of interstate and foreign commerce, for the cost of tug escort for 120,000 DWT tanker is less than one cent per barrel of oil and the amount of oil processed at Puget Sound refineries has not declined as a result of the provision's enforcement. App. 68. Accordingly, we hold that § 88.16.190(2) of the Tanker Law is not invalid under the Commerce Clause.

Similarly, a concurring opinion adopted a *de minimis* approach in concluding that a size limitation on oil tankers did not burden interstate commerce:

> Exclusion of tankers larger than 125,000 DWT has not resulted in any reduction in the amount of oil processed at the Puget Sound refineries. App. 69. Moreover, according to the record, use of a 120,000 DWT tanker rather than a 150,000 DWT tanker increases the cost of shipping oil from Valdez, Alaska, to Cherry Point by a mere $.02 to $.04 per barrel, *id.*, at 64; and the record does not specify the relevant cost data for the Persian Gulf-Cherry Point route. Finally, appellees offered no concrete evidence of any significant disruption in their tanker operations, or of any decrease in the market value of the tankers that they own, as a result of the Tanker Law's provisions.

435 U.S. at 187, n.9.

Finally, we have CF's own statement that the burden is minimal. Because of Wisconsin's geographic location, CF argued in *Raymond* that their refusal to grant permits for doubles disrupted the entire interstate system. In 1977, however, Iowa was a different case:

> Iowa, *which permits 60-foot twin trailers,* enacted administrative regulations to permit 65-foot twin trailers throughout the state, These regulations were recently struck down as improperly promulgated. *Motor Club of Iowa* v. *Department of Transportation et al.*, **251 N.W.2d 510 (March 17, 1977).** ***Iowa's***

> *ban has never had the same deleterious effect that Wisconsin's ban has had. Iowa through traffic can easily be rerouted through Missouri. Wisconsin's traffic cannot because of distance.*

Brief for Appellants, at 26, n.9, *Raymond Motor Transportation, Inc. and Consolidated Freightways Corp.* v. *Rice et al.*, filed May 10, 1977. (Emphasis added.)

CF has failed to prove a substantial reduction in the passage of goods through the Midwest because of increased rates or delays fairly attributable to Iowa's length limitation.

IV. CF CANNOT ATTRIBUTE TO LENGTH LIMITATIONS A BURDEN ON NATIONAL INTERESTS THAT CLEARLY OUTWEIGHS IOWA'S INTEREST IN HIGHWAY SAFETY.

It has been demonstrated above that Iowa's length limitations are rationally related to safety. *Raymond* is distinguished in that vital respect. But Iowa recognizes that the Commerce Clause inquiry extends beyond the Due Process inquiry. See *Raymond*, 434 U.S. at 442-43; Dowling, *Interstate Commerce and State Power*, 27 Va. L.Rev. 1, 21-22 (1940). This Court will invalidate even a rational state regulation if it is demonstrated that national interests in preserving a free trade unit clearly outweigh local interests. *Raymond*, 434 U.S. at 443. In short, this Court will balance the interests. Prior decisions of this Court, however, provide a helpful structure and focus to the weighing of the particular factors involved in assessing Iowa's length limitations.

First, this Court has placed great weight on any colorable safety interest. Deference to state regulation has been greatest in the field of highway safety regulation. See, *e.g.*, *Morris* v. *Duby*, 274 U.S. 135, 143 (1927) (upholding maximum weight limitation); *Sproles* v. *Binford*, 286 U.S. 374, 390 (1932) (upholding comprehensive size and weight limitations); *South Carolina Highway Dept.* v. *Barnwell Bros.*, 303 U.S. 177, 187 (1938) (upholding width and weight limitations); *Maurer* v. *Hamilton*, 309 U.S. 598, 603 (1940) (upholding restriction on trailer protruding over tractor or driver); *Bibb* v. *Navajo Freight Lines*, 359 U.S. 520, 524 (1959) (striking new Illinois requirement of a type of mudguard incompatible with those required in other states); *Raymond Motor Trans., Inc.* v. *Rice*, 434 U.S. 429, 443-44 (1978). This Court has never struck the balance against a local safety regulation unless convinced by evidence in the record that the safety concerns are illusory as a matter of law. Cf. *Bibb, supra; Southern Pacific Co.* v. *Arizona*, 325 U.S. 761 (1945).

Second, while this Court has indicated that substantial increases in costs may be relevant to assessing a claimed burden on interstate commerce, *Raymond*, 434 U.S. at 445, this Court has never, to Iowa's knowledge, stricken a regulation solely on the basis of increased costs to an interstate concern. See *Bibbs*, 359 U.S. at 525-26. Of course, any other approach would totally bar the states from regulations that impact upon interstate commerce because, if a safety regulation were cost-efficient from the business' internal standpoint, it would be adopted voluntarily. As one commentator puts it:

> If a safety device were cost-justified, businesses would adopt it without compulsion. For example, if running long trains caused accidents and railroads had to bear the costs of those accidents, then railroads would voluntarily run shorter trains, provided that the accident costs exceeded the cost of running shorter trains. Regulation by statute occurs either when the legislature rejects efficiency as a criterion or when it seeks to remedy problems arising in the process of internalizing the external costs of a business, such as difficulty in determining the costs of accidents caused by long trains.

Tushnet, *Rethinking the Dormant Commerce Clause*, 1979 Wis.L.Rev. 125, 143.

This Court long ago rejected the view that the dormant Commerce Clause impliedly prohibits all state regulation of interstate commerce. Dowling, *supra* at 4-5.

This Court also has often, although not invariably, framed the balancing inquiry in the terms of *Cooley* v. *The Board of Wardens*, 12 How. 299 (1851): whether the "subjects of this power" are "local" or "national." In *Barnwell*, Justice Stone expressly rejected a lower court finding that interstate carriage by motor trucks had become a national industry, 303 U.S. at 182, and held that "few subjects of state regulation are so peculiarly of local concern as is the use of state highways," *id.* at 187. He stressed that local highways are built, owned and maintained by the States. That is still true today.

CF has argued, and the lower courts apparently have agreed, that the *interstate highway system* is a matter of national rather than local concern. (JS at 8a, 26a). Obviously, in a geographic sense the interstate system is national in scope. And, there is no doubt that the interstate system is of vital importance to the economic well-being of the nation. But the national/local dichotomy is used in the Commerce Clause context as a term of art, referring to the need for national *uniformity*. Matters of acquisition and transfer of real property clearly affect the nation in the most vital way, yet this Court has regularly deferred to state law in this area. See, *e.g.*, *Wilson* v. *Omaha Indian Tribe*, 442 U.S. 653, (1979); *State Land Bd.* v. *Corvallis Sand & Gravel Co.*, 429 U.S. 363, 378-79 (1977).

Moreover, CF's use of the longest vehicles permitted by law makes clear that they do not want "uniformity" in the customary sense of the term, *i.e.*, a national maximum length limit of, say, 65 feet. What CF seeks is a "minimum" maximum of 65 feet. That is not uniformity; that is judicially mandated laissez-faire. Only Congress can create true uniformity.

Congress has provided rather definite clues that it does not believe that there is a need for uniformity in regulations of vehicle size.[7] First, the approach to highways since the Federal Aid Road Act was enacted in 1916, 39 Stat. 355, has been to provide federal financial assistance to the states. Although the assistance has been conditioned on a state's willingness to comply with various federal criteria, the primary responsibility for the construction, maintenance and regulation of our system of highways has rested upon state government. The Federal-Aid Highway Act of 1956 increased the federal percentage contribution and committed massive amounts of federal dollars to highway construction, but Congress did not manifest an intent to modify its "creative federalism" approach to highways. On the contrary, in 1973 Congress enacted what is now 23 U.S.C. § 145, 87 Stat. 261, which provides:

> The authorization of the appropriation of Federal funds or their availability for expenditure under

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[7] One theory of this Court's role under the dormant Commerce Clause is that of enforcing the implied will of Congress. *Southern Pacific Co., supra* at 768; Dowling, *supra* at 6, 17-18, 19-21. Insofar as Congress can be heard, this Court need not rely solely upon implication. In any event, it is clear that with Congressional consent a state may engage in regulation that would otherwise be characterized as an impermissible burden on interstate commerce:

> Congress, of course, has power to regulate the flow of interstate commerce in ways that the States, acting independently, may not. And Congress, if it chooses, may exercise this power indirectly by conferring upon the States an ability to restrict the flow of interstate commerce that they would not otherwise enjoy. See *H.P. Hood & Sons, Inc.* v. *Du Mond,* 336 U.S. at 542-543; *Prudential Insurance Co.* v. *Benjamin,* 328 U.S. 408, 423-434 (1946); *International Shoe Co.* v. *Washington,* 326 U.S. 310, 315 (1945).

Lewis v. *B.T. Investment Managers, Inc.,* —— U.S. ——, filed June 9, 1980, 48 U.S.L.W. 4638, 4643.

> this chapter shall in no way infringe on the sovereign rights of the States to determine which projects shall be federally financed. *The provisions of this chapter provide for a federally assisted State program.* (Emphasis added.)

Second, this Court, virtually since the advent of federal aid to highway programs, has indicated that regulation of vehicle sizes and weights is a "local concern" for purposes of the Commerce Clause. Although this Court has taken pains to point out that Congress could preempt state regulation, see, *e.g.*, *Morris* v. *Duby*, 274 U.S. 135, 143 (1927), Congress has so far declined to enact preemptive legislation. See, *e.g.*, S. Rep. No. 93-1111, 93d Cong., 2d Sess. (1974), at 10.[8]

If this were a case of first impression, little could be inferred from Congressional silence. But Congressional inaction in the face of decades of judicial deference to state highway regulation bespeaks approval. See *Gwin, White & Prince* v. *Henneford*, 305 U.S. 434, 441 (1939); Dowling, *supra* at 25, n.37.

Third, when Congress has expressed concern about the pattern of state size regulation, it has been a concern that the states are capitulating to the trucking industry's desire for ever larger vehicles. For example, Section 108(j) of the Federal Aid-Highway Act of 1956 withheld federal aid for the construction of interstate highways from states in which the maximum allowable weight or width was in excess of statutory limits or state limits in effect on July 1, 1956, whichever is the greater. 23 U.S.C. § 127, 70 Stat. 381.

Congress amended 23 U.S.C. § 127 in 1975, 88 Stat. 2283, to permit "moderate increases" in the allowable weight maximums. S. Rep. No. 93-1111, 92d Cong., 2d Sess. (1974), at 10. Commenting upon its recommendation, the Senate Committee on Public Works stated that it "strongly believes that the ultimate decision on the weights of trucks is a matter for the States, and it wishes to stress that this legislation is not designed as a recommendation for State action." *Id.* "The Committee, in fact, rejected an Administration recommendation that the increases be mandatory on the States, for it is the States which have to determine for themselves—based on the needs of their own economies—the capacities of their road system to accommodate such changes and the costs that may result from the increases." *Id.* "Moreover, the Committee considered and rejected recommendations by the Administration and others to write into law for the first time a Federal guidelines on the lengths of trucks. *The Committee believes that truck lengths should remain, as they have been, a matter for State decision.*" *Id.* (Emphasis added.) Mentioned in connection with those decisions was "the question of safety," as "[h]eavier and larger trucks are said to overstress bridges, cause buffeting of smaller vehicles, and impose a psychological impact on other drivers." *Id.* In addition, Congress adopted a provision in 1975 requiring each state to certify to the Secretary of Transportation that it is enforcing all laws respecting maximum vehicle *size* and weights. 23 U.S.C. § 141, 88 Stat. 2284.

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[8] A preemptive bill fixing truck lengths at 65 feet (S.1390) was passed by the United States Senate on February 20, 1980. 126 Cong. Rec. S1661 (Feb. 20, 1980). As of this writing, the House of Representatives had not acted on the measure.

The appropriate roles of this Court and Congress may be considered from a slightly different perspective. One commentator suggests adopting the following theory of judicial review in Commerce Clause cases:

> The Court should ask, first, whether in its judgment this is an area where uniformity is desirable, and second, whether, if it errs, the appropriate interests will be able to mobilize Congress to act.

Tushnet, *supra* at 153.

In this instance, the interests who oppose longer trucks appear likely to be diffuse and ineffective, with the possible exception of the railroads. The trucking industry, on the other hand, as Tushnet argues at 162-63, is well placed to present a case, if case there be, for requiring the states to permit longer trucks.[9] On the other hand, because a majority of states have acquiesced in industry demands for longer trucks, one would expect that it would be difficult to interest many members of Congress in legislation permitting states to again set length limits lower than prevail in their own states.

This Court has only rarely invalidated nondiscriminatory state laws on the theory that they indirectly create a burden on interstate commerce. There may be a number of reasons for this, but among them are 1) that in dormant Commerce Clause cases, unlike, say, First Amendment cases, this Court is the first rather than the last line of constitutional defense, and 2) Congress has a far wider ranger of options than this Court with which to confront complex social and economic problems. Here, CF invites this Court to weigh two incommensurables, safety and efficiency, and offers this Court a choice only between continuing the tradition of state regulation and a novel laissez-faire regimen. Congress, if convinced there were a problem with the status quo, could consider additional options such as true uniformity (a maximum limit rather than a minimum limit) or different limits for different classes of highways and vehicles. In addition, Congress could consider pragmatically that length increases are followed by demands for weight increases. Congress could balance the claimed efficiencies of ever larger vehicles with the increased need for highway maintenance revenues. Congress could balance the claimed short-term gains in efficiency from larger trucks against the potential impact on the optimum mix with other modes of transportation. Congress could more easily change its mind with rapid developments in energy supply and transportation technology.

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[9] As the industry itself states:

> In the lexicon of Washington journalists, the word 'powerful' is the standard descriptive adjective whenever the trucking industry lobby is mentioned. For all its repetition, the phrase is not a cliche. With at least one trucking company operating in every congressional district in the country, and with a national organization coordinating policy, the trucking industry is a force to be reckoned with on Capitol Hill. And the industry's eyes and ears, its front line in the legislative arena, is the ATA Government Relations Division.

American Trucking Associations, Inc., *1979 Annual Report*, at 16.

This Court has never attempted to balance safety and efficiency. A statement in *Firemen* accurately conveys this Court's practice:

> Nor was it open to the District Court to place a value on the additional safety in terms of dollars and cents, in order to see whether this value, as calculated by the court, exceeded the financial cost to the railroads.

Firemen, 393 U.S. at 139.

CF offers no good reasons for departing from that tradition.

CONCLUSION

The judgment of the Court of Appeals should be reversed.

Respectfully submitted,

Thomas J. Miller
Attorney General of Iowa

Mark E. Schantz
Solicitor General
Department of Justice
2nd Floor, Hoover Building
Des Moines, Iowa 50312
(515) 281-5191

Robert W. Goodwin
Special Assistant Attorney General
Department of Transportation
Ames, Iowa 50010
(515) 296-1521

Lester A. Paff
Assistant Attorney General
Department of Transportation
Ames, Iowa 50010
(515) 296-1636

Attorneys for Appellants

APPENDIX

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Iowa Code (1979), Section 321.457:

321.457 *Maximum length.* The maximum length of any motor vehicle or combination of vehicles, except fire fighting apparatus and vehicles operated in the daytime when transporting poles, pipe, machinery or other objects of a structural nature which cannot be dismembered readily when required for emergency repair of public service facilities or properties, and such vehicles transporting such objects operated at nighttime by a public utility when required for emergency repair of public service facilities or properties but in respect to such night transportation every such vehicle and the load thereon shall be equipped with a sufficient number of clearance lamps on both sides and marker lamps upon the extreme ends of any projecting load to mark clearly the dimensions of such load, at which time, a member of the state highway patrol shall be notified prior to the operation of such vehicle, shall be as follows:

1. No single truck, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

2. No single bus, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

3. Except as to combinations of vehicles, provisions for which are otherwise made in this chapter, no combination of truck tractor and a semitrailer hauling livestock shall have an overall length, inclusive of front and rear bumpers, in excess of sixty feet, nor shall any other combination of vehicles coupled together, unladen or with load, have an overall length, inclusive of front and rear bumpers in excess of fifty-five feet. Combinations of vehicles

consisting of a motor vehicle upon which a van box is fastened and which draws and bears a portion of the weight of a semitrailer purchased by an Iowa resident prior to April 16, 1974, may be operated on the highways of this state with a length exceeding fifty-five feet but not exceeding sixty feet, if a special overlength permit is obtained from the department for such operation. This special overlength permit shall be issued for the vehicle and such permit shall be valid until such time as the vehicle is no longer operable or until the owner of the vehicle transfers title to the vehicle to a nonresident. All such vehicles purchased after April 16, 1974, shall not be allowed to operate on the highways of this state.

4. However, a mobile home not in excess of forty-eight feet in length may be drawn by any motor vehicle, except a motor truck, provided, however, that the mobile home and its towing unit shall not be in excess of an overall length of sixty feet. For the purposes of this subsection, a light delivery truck, panel delivery truck or 'pickup' shall not be construed to be a motor truck. Further providing that a portable livestock loading chute not in excess of a length of thirteen feet including its hitch or tongue may be drawn by any vehicle or combination of vehicles, provided that such vehicle or combination of vehicles drawing such loading chute is not in excess of the legal length provided for such vehicles or combinations.

5. No combination of vehicles coupled together which are used exclusively for the transportation of passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, travel trailers, boats, farm and industrial tractors and self-propelled farm implements, nonself-propelled implements of hus-

bandry, and self-propelled vehicles shall have an unladen length, inclusive of front and rear bumpers in excess of sixty feet, but the passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, or boats being transported may extend up to three feet beyond the front and rear bumpers of the transporting vehicles when the overall length of the vehicle with load does not exceed sixty-five feet.

6. No combination of three vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of sixty feet.

7. A motor vehicle or combination of vehicles may be operated upon the highways of this state, irrespective of the length and weight limitations imposed by the laws of this state, if the motor vehicle or combination of vehicles is operated within the corporate limits of a city abutting a border of this state and such operations have been approved by ordinance of the city council and if the length and weight of the motor vehicle or combination of vehicles is in conformity with the laws relating to length and weight of the abutting state on July 1, 1974. If a city council has authorized such operation upon highways within the corporate limits, then the limit of travel for such motor vehicles or combination of vehicles within the state is extended to the commercial zones as described by federal regulations concerning interstate commerce, 49 code of federal regulations, paragraphs 1048.10, 1048.38, and 1048.101 as they exist on July 1, 1974.

Supreme Court, U. S.
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No. 79-1320

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

RAYMOND KASSEL, *et al.*,
Appellants,
v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

BRIEF FOR THE APPELLEE

JOHN H. LEDERER
JOHN DUNCAN VARDA
ANTHONY R. VARDA

DEWITT, SUNDBY, HUGGETT
& SCHUMACHER, S.C.
121 South Pinckney Street
Madison, Wisconsin 53703
(608) 255-8891

Attorneys for Appellee

August 16, 1980

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ISSUE PRESENTED

Was It Error For The District Court To Make Findings Of Fact?

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No. 79-1320

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

RAYMOND KASSEL, *et al.*,
Appellants,
v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

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BRIEF FOR THE APPELLEE

STATEMENT OF THE CASE[1]

The 65-foot twin is a standard vehicle for interstate transportation of general commodity freight.[2] General commodity carriers, such as Appellee Consolidated Freightways,[3] offer services throughout the country and serve many communities by interchanging equipment with other carriers. Twins offer distinct operating advantages in the carriage of general commodity freight including more rapid and flexible service, reduced cross-dock handling, reduced exposure of freight to damage or loss, improved fuel efficiency, and improved service to smaller towns.[4] The low density, high value cargo normally carried by common carriers is particularly suited to twin trailer operations, and there is no rail competition for the cargo involved.[5]

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[1] Following the *Manual for Complex Litigation*, the District Court's Pretrial Order required the parties to prepare detailed statements of all facts to be proven at trial. Many facts are admitted in the joint statement of facts. For the convenience of the Court, all the evidence is indexed to these pretrial factual statements in Document No. 58. Indices by witness name are also available in Court Exhibit 1, Document No. 55.

[2] A. 22, 58, 245, 277, 603; As in the District Court's opinion, reference to twins or twin trailers will be to 65-foot twin trailers, unless a different length is so identified.

[3] Consolidated Freightways Corporation of Delaware, hereafter "CF."

At the commencement of this action, 33 states permitted the operation of 65-foot twins.[6] With the exception of Iowa, those states prohibiting 65-foot twins are located in the East or Southeast. Though 17 Eastern states prohibit twins, Iowa is the only state that limits twins to 60 feet, and the only state in the region that prohibits 65-foot twins.[7] The odd-sized trailer of the 60-foot twin cannot be interchanged. (A. 23, 276-277)

As a result of Iowa's ban, East-West traffic that would normally cross Iowa via Interstate 80 is diverted through northern Missouri via U.S. 36, predominantly a two-lane highway. The ban forces North-South traffic to either be diverted or moved in semis through Iowa. Traffic originating and terminating in Iowa, other than in border cities, must be moved in semis or shuttled in twins singly between Iowa terminals and staging areas at Iowa's borders.

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[4] *Raymond Motor Transportation, Inc. v. Rice*, 434 U.S. 429, 432 n. 1 (1978).

[5] In its amicus brief, the Association of American Railroads argues that railroads compete directly for the traffic involved. The record, including a survey of AAR members, flatly contradicts this statement. (A. 601; Tr. 847-848; CF Ex. 2, pp. 127-138, Tr. 107-108)

[6] Appellants have included a recent AASHTO (American Association of State Highway and Transportation Officials) chart which purports to show state size restrictions. (A. 645) The chart is in error as it omits administrative rules, turnpike regulations, and annual permits under which 65-foot twins routinely operate in various states, e.g., Wisconsin and Montana. (A. 605; Tr. 252) AASHTO's recommended length standard is 55 feet for semis and 65 feet for twins. (A. 603)

[7] The map at page 605 of the Appendix is a substitute for the exhibit at trial because of the unavailability of copies. The sole pertinent difference is the effective date and the inclusion of Iowa as a 65-foot twin state, as a result of the decision below.

Iowa's unique length limit on twins results in delays, increased exposure of cargo to damage, and increased costs of operation. The unnecessary vehicle miles caused by the ban mean:

> ". . . [A] greater overall exposure to accidents and fatalities. More miles of highway are subjected to wear. More fuel is consumed and greater transportation costs are incurred." 475 F. Supp. 544, 550 (J.S. 24a).

Interstate highways in Iowa present no unique circumstances requiring limitation of traffic due to congestion or deterioration. (A. 444-446, 632) The addition of 65-foot twins on the Interstate highways in Iowa would have no discernible effect on the highways' excellent level of service. (A. 632-635) Because of their axle spacing, twins cause substantially less roadwear than semis on the pavement predominantly involved. (A. 596-598, 615-616)

The District Court concluded:

> "The evidence convincingly, if not overwhelmingly, establishes that the 65 foot twin is as safe as, if not safer than, the 60 foot twin and the 55 foot semi." 475 F. Supp. 544, 548 (J.S. 21a).

Appellants were unable to produce a single witness who would state an opinion as to the overall safety of 65-foot twins as opposed to other large commercial vehicles.[8]

Appellants made three main arguments: (1) the safety evidence was inconclusive; (2) some characteristics of the twin were less desirable than the semi; and (3) even if the twin were as safe as the semi, Iowa had the prerogative to divert twins in order to reduce truck traffic through Iowa. They also argued that the burden was insubstantial by comparison to increasing costs in the motor carrier industry.

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[8] 475 F. Supp. 544, 549 (J.S. 21a); see, e.g., A. 270.

The District Court rejected each of these defenses, specifically holding the evidence of 65-foot twin safety to be conclusive. The District Court evaluated all safety characteristics in reaching its conclusion. Appellants' "diversion" argument was rejected as a local purpose of little weight in the balancing process, since the diversion merely shifted interstate traffic to other states, increasing overall mileage and, thus, increasing the number of accidents, injuries, and fatalities associated with the traffic. It also noted that, based on 1974 carrier operating costs as estimated by the Iowa DOT, the burden on all carriers amounted to at least $12,644,000 annually, and the Appellants' efforts to show the monetary burden to be inconsequential were inappropriate. 475 F. Supp. 544, 547 n. 2 (J.S. 18a).

On appeal, Appellants presented two arguments: (1) the District Court erred in failing to defer to the Iowa Legislature once a "colorable" safety justification was shown, and (2) "by prohibiting traffic that might otherwise flow through the state, Iowa's law promotes legitimate local safety interests." 612 F.2d 1064, 1068 (J.S. 5a-6a).

The Court of Appeals rejected Appellants' arguments. It agreed that the proper issue was overall safety and found the District Court's conclusions on twin trailer safety to be well supported in the record. The Court of Appeals reaffirmed that a state may prohibit an unsafe vehicle, even if it were permitted by other states, but tersely disapproved the argument that Iowa could properly divert traffic to other states to reduce accidents in Iowa. The Court of Appeals noted that, where the local safety advantages are not gained directly by banning an unsafe vehicle but indirectly by harming a larger "countervailing safety interest in other states," a balancing favoring interstate commerce[9] is "automatic." 612 F.2d 1064, 1069-70 (J.S. 9a-10a).

The Court of Appeals also pointed to Iowa's numerous size and weight exemptions as undercutting Appellants' safety claim, even if not directly discriminatory. 612 F.2d 1064, 1070 (J.S. 10a).

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[9] Amicus AAR has chosen to misinterpret this portion of the Appellate

. . . (Continued on Page 5)

SUMMARY OF ARGUMENT

This Court has abandoned Commerce Clause tests for constitutionality which are predicted on sovereignty concepts. Such tests are not functional and unduly restrict state regulation of interstate commerce. The *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970), balancing test used in their stead has been applied to resolve conflicting state and local interests.

The *Pike* balancing test is appropriate in cases involving safety regulations, but it should be applied with two corollaries: (1) certain state regulations should be accorded a strong presumption of validity, and (2) the courts should not judge whether the economic costs of a regulation promoting safety are greater than the safety benefits.

The strong presumption of validity should only be accorded in those cases where it protects the safety interests. Its purpose is to protect safety, not state regulations.

In *Raymond Motor Transportation, Inc. v. Rice*, 434 U.S. 429 (1978), this Court suggested that the strong presumption of validity is accorded on the basis of sovereignty concepts; safety, particularly highway safety, is a field peculiarly local. That suggestion is inappropriate. Safety, and especially the safety of interstate commerce, is imbued with national as well as state interest. Moreover, the national interest in the safety of interstate commerce and the state's interest in local safety may conflict. Because of that conflict, and because of the numerous other economic, social, and political considerations present in legislative decisions, state determinations of whether a regulation promotes safety cannot be relied upon and should not be deferred to.

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9. . . . (Continued from Page 4)

Court's decision as a balance between Iowa's safety interest and the nation's economic interest. A review of the decision shows the Appellate Court was including the safety interests of surrounding states as part of the dominant national interest. 612 F.2d 1064. 1070 (J.S. 10a).

The strong presumption of validity should be accorded where its presence promotes safety. It should be given to state regulations whose effects on safety can only be positive or, at worst, neutral. In those cases, however, where the state regulation may either promote or harm safety, the strong presumption of validity should not be accorded. To accord it in such a case is as likely to harm safety as promote it.

The differentiation explains the seemingly inconsistent reasoning of this Court in *Southern Pacific Co. v. Arizona*, 325 U.S. 761 (1945), *Brotherhood of Locomotive Firemen & Enginemen v. Chicago, R.I.&P.R. Co.*, 393 U.S. 129 (1968), and *Raymond*. On the facts as presented, *Brotherhood* and *Raymond* were cases where the regulation either promoted safety or had no effect on it. The regulations could not harm safety. The strong presumption of validity was properly accorded to the state regulation. In *Southern Pacific*, however, if the Arizona train length law were ineffective in reducing slack coupling accidents, or if those accidents were unimportant, it harmed safety. Shorter trains meant more trains, and more trains, more accidents. In such a case, no strong presumption of validity was accorded. Instead, the court judged the total effect on safety, free of any presumption save the normal presumption of constitutionality.

This case is like *Southern Pacific*. If 65-foot twins are safe vehicles, Iowa's ban increases the number of accidents associated with interstate traffic by increasing vehicle miles. Use of the strong presumption of validity is inappropriate. The trial court should have judged from the facts the total effect on safety, without the strong presumption of validity.

Regardless of the test used, the facts in this case are conclusive. Even after according the state the strong presumption of validity, the trial court found the evidence of 65-foot twin trailer safety to be conclusive. That decision is, in effect, concurred in by Iowa, as it permits the operation of 65-foot twins where they benefit local interests and where interstate through traffic can be avoided.

Because of the strength of the factual case, Appellants are forced to argue their case on the basis of presumptions, contending that the presumptions should have foreclosed the trial court from reviewing the facts. That argument is faulty. The presumptions are contradicted by the facts, and Appellants cannot offer valid reasons for ignoring the contradictions.

Iowa's ban imposes a significant economic burden on interstate commerce. Moreover, it makes that commerce more hazardous. It gains no local benefit save that achieved by diverting traffic to other states. It thus cannot be sustained under the Commerce Clause.

ARGUMENT

I. CONTROLLING CONSTITUTIONAL CONSIDERATIONS.

A. The Commerce Clause Provides Federal Supremacy Over Interstate Commerce.

Since the inception of this nation, there has existed an inherent conflict between national and state regulation of commerce. Dissatisfaction with individual state regulation led directly to the Constitutional Convention and the adoption of the Commerce Clause.[10] The Commerce Clause preempted state action where Congress had acted, but left open the more difficult question of whether and to what extent the states could regulate interstate commerce in the absence of Congressional action.

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[10] "The sole purpose for which Virginia initiated the movement which ultimately produced the Constitution was 'to take into consideration the trade of the United States; to examine the relative situations and trade of the said states; to consider how far a uniform system in their commercial regulations may be necessary to their common interest and their permanent harmony' and for that purpose the General Assembly of Virginia in January of 1786 named commissioners and proposed their meeting with those from other states. Documents, Formation of the Union, 12 H. Docs., 69th Cong., 1st Sess., p. 38." *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 533 (1949); see also THE FEDERALIST, NO. XLII.

By ratifying the Constitution, the states surrendered to the federal government the power to regulate interstate commerce. Thereafter, any state regulation of interstate commerce was at the sufferance of the federal government. The willingness of the states to delegate that power was not the result of strong federal sentiment, rather it stemmed from a pragmatic recognition that individual states can and will interfere with commerce to gain local advantage.[11] The Commerce Clause thus not only provided uniformity in regulation, it protected each state from its sister state. This Court has repeatedly held that even absent Congressional action, the Commerce Clause restrains state powers over interstate commerce and makes them subordinate to the interests of the nation as a whole.[12]

Our federal system, however, derives many of its advantages from diffusion of power, the ability of local governments to respond to local concerns and the possibility of experimentation to develop new methods of solving problems.[13] In numerous instances, state regulation of interstate commerce is desirable. If the evils of disparate regulation can be avoided, the benefits of local regulation are obvious. Thus, the consistent problem approached in interpretation of the Commerce Clause has been how to permit state regulation while preserving the national policies from its possible harms.

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[11] "No other federal power was so universally assumed to be necessary, no other state power was so readily relinquished . . . The states were quite content with their several and diverse controls over most matters but, as Madison has indicated, 'want of a general power over Commerce led to an exercise of this power separately, by the States, which not only proved abortive, but engendered rival, conflicting and angry regulations.' 3 Farrand, Records of the Federal Convention 547." *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 534 (1949).

[12] "For a hundred years it has been accepted constitutional doctrine that the commerce clause, without the aid of Congressional legislation, thus affords some protection from state legislation inimical to the national commerce, and that in such cases, where Congress has not acted, this Court, and not the state legislature, is under the commerce clause the final arbiter of the competing demands of state and national interest." *Southern Pacific Co. v. Arizona*, 325 U.S. 761, 769 (1945).

[13] Indeed, 65-foot twins have developed as a vehicle to solve the problems of low density, high value, small cargo shipments. The diversity of state regulation allowed the original twin trailer operations in the 1940s, from which the standard 65-foot twin evolved in the late 1950s. (A. 43-44, 94, 378)

B. The Necessary Balancing In Commerce Clause Cases Is Between The Competing Interests, Not Between Definitions Of Sovereign Power.

Prior to use of the balancing test in *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970), legal attempts to delineate the scope of permissible state regulation were based on definitions of sovereign power within the federal system. Historically, two tests were developed based on definitions of relative sovereignties: the "local - national" subject matter test, and the "direct - indirect" regulation test. Neither test proved satisfactory. The tests resulted in either inconsistent decisions or the piecemeal demise of state regulation.

The "local - national" test was first enunciated in *Cooley v. Board of Wardens*, 53 U.S. (12 How.) 299 (1851). As outlined in *Cooley*, the court first determines whether the subject matter area is principally local or national in nature. If local, the state regulation prevails; if national, the federal government has exclusive power. The test was not successful because in the same subject matter area different factual situations could be presented in which the national interests vary from minimal to significant. To protect the significant national interest, the subject matter approach had to prohibit all state regulation of the subject matter. Reasonable state regulation was prohibited or consistency in labeling subject matter areas was sacrificed.[14]

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[14] Compare, *Pennsylvania v. Wheeling and Belmont Bridge Co.*, 54 U.S. (13 How.) 518 (1851), striking down, in part on Commerce Clause grounds, a bridge which interfered with interstate river traffic, with *Escanaba and Lake Michigan Transportation Company v. Chicago*, 107 U.S. 678 (1883), upholding an ordinance which prohibited the bridge opening despite interference with interstate river traffic. Compare also, *Hughes v. Oklahoma*, 441 U.S. 322 (1979) with *Geer v. Connecticut*, 161 U.S. 519 (1896) and *Lacoste v. Department of Conservation*, 263 U.S. 545 (1924).

The "direct - indirect" dichotomy once used by this Court suffers similar difficulties. It rests on the proposition that some state regulation of interstate commerce is merely incidental to regulation of other matters within the sovereignty of the state. Such incidental regulation is therefore permissible. An incidental burden, however, may be so great a practical burden as to seriously impede national interests. Moreover, the approach prohibits any direct regulation of interstate commerce that may well promote national interests.

Neither test which attempts to delineate between permissible and impermissible state regulation based on definitions of respective sovereignties has been successful in answering the underlying question: Does the local purpose provide sufficient justification for the burden imposed on commerce? The balancing test outlined in *Pike* focuses on the actual interests involved, thereby producing sufficient flexibility to accommodate the myriad of factual situations possible. By limiting state regulation only when the nation's interests outweigh local interests, it provides the widest latitude for state action.[15]

A careful definition of what is being balanced is important, for it directly affects the nature of the special presumption of validity accorded state regulations in the area of health and safety.

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[15] Though this Court has abandoned the "local-national" and "direct-indirect" tests, it somewhat confusingly continues to use the terms. Thus, in *Ray v. Atlantic Richfield Co.*, 435 U.S. 151 (1978) and *Raymond*, there is language that speaks in terms of "local-national" subject matter. Analysis of all the recent decisions of the Court will show, however, that the *Pike* standard is continually applied in practice. The terms "local-national," as with "direct-indirect," become little more than descriptions of the final balance reached:

> "In thus making use of the expressions, 'direct' and 'indirect interference' with commerce, we are doing little more than using labels to describe a result rather than any trustworthy formula by which it is reached."
> *DiSanto v. Pennsylvania*, 273 U.S. 34, 44 (1927) (Justice Stone dissenting).

C. The Primacy Of The Safety Interest Controls The Special Considerations Afforded State Safety Regulations.

This Court has shown special consideration for safety in two distinct ways. First, certain safety regulations enjoy a "strong presumption of validity." Second, the courts will not, save in the extreme case, balance safety interests and economic interest. If that balance is to be made, it is a matter of policy to be decided by a legislature, state or federal. In the absence of a political decision, the courts will automatically grant priority to the safety interest.

The Strong Presumption of Validity. This Court, however, has not offered clear guidance as to when the "strong presumption of validity" attaches. Analysis of the purpose of the presumption is necessary to determine when it should attach and its proper scope.

In *Raymond, supra*, this Court suggested that the presumption attaches because of the state's sovereignty in this area:

> "Nevertheless, it also is true that the Court has been most reluctant to invalidate under the Commerce Clause 'state legislation in the field of safety where the propriety of local regulation has long been recognized.' Pike v. Bruce Church, Inc., supra, at 143, 25 L Ed 2d 174, 90 S Ct 844, quoting Southern Pacific Co. v Arizona ex rel. Sullivan, supra, at 796, 89 L Ed 1915, 65 S Ct 1515 (Douglas, J., dissenting)." 434 U.S. 429, 443.

The suggestion that sovereignty is the predicate of the presumption may, in part, result from the fact that the language describing the presumption predates the *Pike* balancing test. According the presumption for the purpose of protecting sovereignty concepts, however, suffers from the same logical difficulties and lack of utility as did the Commerce Clause tests based on sovereignty.

Safety, and particularly the safety of interstate commerce, is not a field exclusively involving state interests. The nation's interest in the safety of interstate commerce is at least as great as its interest in the economic efficiency of the commerce. Congress may preempt state regulations in this field if it desires. Even in the absence of Congressional action, there may be conflicts between local safety interests and national safety interests in which the national interest should prevail.

Nor can it be contended that deference to the state legislative judgment necessitates the granting of the presumption. If there is a conflict between national and state safety interests, the state is peculiarly ill-suited to resolve that conflict.

> "I do not think the United States would come to an end if we lost our power to declare an Act of Congress void. I do think the Union would be imperiled if we could not make that declaration as to the laws of the several States. For one in my place sees how often a local policy prevails with those who are not trained to national views and how often action is taken that imbodies what the Commerce Clause was meant to end." Holmes, "Law and the Court," Collected Legal Papers, 295-296.

Even absent such a direct conflict, a legislature is a poorly constituted body to make a factual judgment as to whether or not a regulation promotes safety. Rarely is the issue presented to the legislature purely in terms of safety. The very factors that make the legislature the only body able to determine whether the economic costs outweigh the safety costs prejudice the legislature's factual judgment as to safety. Interests other than safety are inextricably intertwined in the legislative process. To what extent was Arizona's train length law based on safety grounds, and to what extent based on increasing employment for Arizona train crewmen?[16] To what extent was Illinois' mudflap law based on the safety of the mudflaps, and to what extent on the political influence of the local manufacturer of the device?[17]

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[16] *Southern Pacific Co. v. Arizona*, 325 U.S. 761 (1945).

[17] *Bibb v. Navajo Freight Lines, Inc.*, 359 U.S. 520 (1959).

Even in this case Appellants suggest that the principal factors in Iowa's safety determination of the length of trucks are the editorial policy of an influential newspaper, and the political power of a narrow interest group.[18]

We do not suggest that the state regulation should never be accorded a strong presumption of validity because of the presence of these political factors. We do suggest that the presumption should not be accorded on the basis of an assumption that the legislature has made an objective determination of the safety aspects of the regulation.[19] The purpose of the strong presumption of validity is not to preserve state legislative acts. The normal presumption of constitutionality achieves that purpose. The purpose of the strong presumption of validity is to ensure that judicial decisions in the Commerce Clause area do not jeopardize safety interests. The strong presumption should be accorded on the basis of how the safety interest appears in the case.

Attaching the strong presumption of validity to the safety regulation insures that if the trial court errs, it errs on the side of safety. Such a cautious approach is often possible. In the normal case, if effective, the state regulation will promote safety; if ineffective, it will do no harm to safety. A plaintiff, who challenges a regulation which can only promote safety or be ineffective, must prove by a strong factual case that the regulation is ineffective.

That approach was possible in *Raymond*. On the facts as presented, Wisconsin's regulation banning 65-foot twins either promoted safety or was ineffective.[20] It was properly accorded a strong presumption of validity. Plaintiffs produced a factual case sufficient to overcome the strong presumption of validity. Similarly, in *Brotherhood*[21], the Arkansas train crew law was a regulation that also could only promote safety. The requirement of extra train crew members could only reduce the number of train accidents. It could not increase them.[22] In that case, the evidence of ineffectiveness was not convincing and could not overcome the strong presumption of validity.[23]

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[18] Appellants' Br. 23. (A. 276; see also, 500-502)

[19] This Court has also suggested that the state legislature has a significant expertise in the highway area because the facts bearing on roads vary from locality to locality. *Raymond v. Rice*, 434 U.S. 429, 444 n. 18 (1978). But that is true in almost any Commerce Clause case. Local interests vary from the national interests because of local factors. Moreover, the idea of geographical variation becomes questionable when the highways involved are Interstate highways built to federal design and construction standards with local variation at a minimum.

But a cautious approach is not always possible. Not all state regulations are either supportive of safety or merely ineffective. Some safety regulations, if ineffective, create hazard. In *Southern Pacific*,[24] the state regulation limiting train length purportedly promoted safety by reducing slack coupling accidents. If it was ineffective in doing so, however, or if slack coupling accidents were relatively unimportant, the regulation created hazard. Shorter trains meant more trains, and more trains inarguably increased the number of train accidents, not just in Arizona but in surrounding states as well. In reviewing the facts, this Court did not give the Arizona regulation a strong presumption of validity. Rather, it reviewed the record to determine the overall effect on safety.[25]

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[20] A case could have been presented that Wisconsin's ban detracted from safety but was never fully developed. The onus of footnote 25 in *Raymond* must be shared equally by counsel on both sides.

[21] *Brotherhood of Locomotive Firemen & Enginemen v. Chicago, Rock Island & Pacific Railroad*, 393 U.S. 129 (1968).

[22] There is a marginal suggestion of an increase in hazard because the increase in crewmen might result in more injuries to the crew in an accident, but the facts supporting the argument were apparently never developed. *Chicago, Rock Island & Pacific Railroad v. Hardin*, 274 F. Supp. 294 (W.D. Ark. 1967).

[23] The trial court opinion suggests that there might be some incremental safety advantage to additional crewmen. The trial court improperly compared that safety advantage with the economic burden.

[24] *Southern Pacific Co. v. Arizona*, 325 U.S. 761 (1945).

[25] "The trial court found that the Arizona law had no reasonable relation to safety, and made train operation more dangerous. Examination of the

. . . (Continued on Page 15)

A different analysis, as suggested by *Southern Pacific*, is necessary when confronted with a state regulation which may as easily harm safety as promote it. Certainly the regulation is entitled to a presumption of constitutionality. But the strong presumption of validity, referred to in *Bibb* and *Raymond*, should attach only to regulations whose only possible effect on safety is positive. If that presumption were given to a regulation which may actively harm safety, the presumption may lead to a decision which harms safety, thus undermining the very purpose for allowing the presumption.[26]

Where the regulation is shown to carry the potential for adverse effects on safety, it is incumbent upon the trial court to judge from the facts, free from any but the normal presumption of constitutionality, whether the regulation actually promotes overall safety. The trial court must determine the "total effect" on safety. The comparison in such a situation is not simply between the state's safety interest and the plaintiff's economic cost. Instead, the safety interest may appear on either side of the equation. If the equation is distorted by a strong presumption of validity, the risk is not simply the upholding of an ineffective

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25. . . . (Continued from Page 14)

evidence and the detailed findings makes it clear that this conclusion was rested on facts found which indicate that such increased danger of accident and personal injury as may result from the greater length of trains is more than offset by the increase in the number of accidents resulting from the larger number of trains when train lengths are reduced. *In considering the effect of the statute as a safety measure, therefore, the factor of controlling significance for present purposes is not whether there is basis for the conclusion of the Arizona Supreme Court [and Legislature] that the increase in length of trains beyond the statutory maximum has an adverse effect upon safety of operation." Southern Pacific Co. v. Arizona*, 325 U.S. 761, 775 (1945) (Emphasis added)

[26] The use of the "rational relation test" which Appellants espouse would be even more damaging in such a situation. A regulation which promotes some aspects of safety, while creating greater hazards in other aspects, will always meet the rational relation test. The problem has been implicitly recognized by this Court. *Compare*, footnote 25, supra, with *South Carolina State Highway Department v. Barnwell Bros.*, 303 U.S. 177, 191-192 (1938).

regulation and resulting economic loss. The result may be both economic and safety losses.

Restraints On Legislative Balancing Of Costs And Safety. The balancing of safety and economic cost is a matter of public policy to be decided by a legislature, state or federal, and not by the courts.[27] This Court has consistently refused to respond to the question: How much safety at what price?

In *Brotherhood*, the district court found that the state train crew law was only minimally effective. If it promoted safety at all, it did so only slightly and the economic cost was unwarranted. This Court reversed. The question of whether safety justified the cost was a legislative issue:

> "In the absence of congressional action, however, we cannot invoke the judicial power to invalidate this judgment of the people of Arkansas and their elected representatives as to the price society should pay to promote safety in the railroad industry." 393 U.S. 129, 144.

The legislature, however, is not entirely free in its policy determination. In *Raymond*, this Court noted that Wisconsin's numerous exemptions to its length limit undercut the presumption of validity accorded to purported safety regulations. The result is appropriate, but the method of reaching it should be somewhat different. If the strong presumption is accorded because of the primary interest in safety, a state's hypocrisy should not directly affect the presumption. Whether the measure does or does not promote safety is a question of fact. The state's inconsistency does not change that factual conclusion.

However, when the policy judgment as to the economic cost of safety is made by a state legislature, it may not strike a different balance for local as opposed to interstate commerce. If the state determines that a safety gain is outweighed by economic costs when the costs are borne by local interests, it must make the same determination when the costs are borne by out-of-state groups. State regulations which permit exceptions for local interests strongly suggest that the safety reasons for the regulation are actually viewed by the state as slight and outweighed by the economic burden.

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[27] "Nor was it open to the District Court to place a value on the additional safety in terms of dollars and cents, in order to see whether this value, as calculated by the court, exceeded the financial cost to the railroads." *Brotherhood of Locomotive Firemen & Enginemen v. Chicago, Rock Island & Pacific Railroad*, 393 U.S. 129, 139 (1968).

D. No Strong Presumption Of Validity Should Be Accorded Iowa's Ban Of Twin Trailers.

In analyzing the case at bar, the trial court looked to *Raymond* and found it to be controlling. That was a natural reaction as much of the evidence, most of the witnesses, and many of the arguments were the same. However, though the case at bar completely incorporates the facts of *Raymond*, it goes further by showing a safety hazard arising from Iowa's ban. This case thus is more analogous to *Southern Pacific, supra.* In this case, as in *Southern Pacific*, the state regulation is one which, if ineffective, harms safety.

The uncontroverted evidence here is that Iowa's ban increases the number of accidents, injuries, and fatalities associated with the interstate traffic at issue. The amount of the increase is not small. The diverted traffic must travel 32% farther than the direct route through Iowa, thereby increasing the probability of accidents, injuries, and fatalities by at least 32%.[28] (A. 604) The safety hazard exists regardless of how carriers respond to Iowa's ban. If they use 55-foot semis or 60-foot twins, they must use more vehicles to carry the cargo, thereby increasing exposure to accidents over the entire journey. Shuttling 65-foot twins through Iowa obviously doubles the exposure.

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[28] This hazard is further amplified by the fact that the diversion route is over roads which are often two-lane, with at-grade intersections, and passing through congested urban areas. The two-lane sections of the diversion route have accident frequencies at least twice as high as those of the Interstate routes through Iowa. (A. 632) For CF, the Iowa regulation is conservatively estimated to produce 10 additional accidents per year. (A. 614) The Iowa DOT, considering only the extra miles and making no allowance for the less safe roads on the diversion route, estimated the annual increase in accidents caused by the ban to be 96 in 1975. (A. 584, 604)

Following this Court's suggestion in *Raymond*, the trial court erroneously accorded a strong presumption of validity to Iowa's regulation. Nonetheless, the trial court found the evidence to be conclusive "if not overwhelming" in proving that 65-foot twins are as safe or safer than 60-foot twins and 55-foot semis. The state was thus allowed every benefit of the doubt.

In practice, Iowa has concurred with the District Court's determination as to the relative safety of 65-foot twins. Where it has been possible for Iowa to obtain the benefits of 65-foot twins for its citizens without permitting interstate through traffic of little or no benefit to Iowa, Iowa has had no trouble in concluding that 65-foot twins possess no safety hazards. Its own staff of experts in the area who studied the problem at the instruction of the legislature, found there to be no evidence of safety hazard in the operation of 65-foot twins. (A. 584-596) Indeed, those officials who are responsible for the existence and continuance of Iowa's ban have testified that *they have upheld the ban not because of perceived safety problems with the vehicle but out of a desire to avoid increased interstate traffic of no benefit to Iowa.*[29]

II. THE LEGAL STANDARDS PROPOSED BY APPELLANTS ARE FAULTY.

A. Appellants Substitute Discredited Presumptions For Fact.

Appellants suggest that the trial court erred in the standards it applied. The trial court, they contend, should have recognized the "legislative fact" that length limits promote safety.

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[29] See e.g. the Governor's veto of the 65-foot twin trailer bill. (A. 171-173, 626) The only mention of vehicle safety, as opposed to an increase in accidents because of greater traffic, is a mention of higher fatalities per accident. . . . (Continued on Page 19)

It should then have determined that the Iowa regulation was a length limit and, therefore, under the first premise, promoted safety. It should have terminated its analysis out of deference to the legislature since Plaintiff failed to show that length is never related to safety.

The same argument was presented by Wisconsin in *Raymond, supra.*[30] It is telling comparison that after a lengthy trial, Appellants must substitute a presumption for their factual case as did Wisconsin. The arguments share the same purpose: the trial court would be foreclosed from reviewing the facts because presumptions, assumptions, and deference to legislative judgment would make the facts irrelevant.

That is certainly not the lesson of *Raymond:*

> "The District Court, without mentioning this evidence, suggested that language in Morris v Duby, 274 US 135, 144, 71 L Ed 966, 47 S Ct 548 (1927) and Buck v Kuykendall, 267 US 307, 315, 69 L Ed 623, 45 S Ct 324, 38 ALR 286 (1925), established a principle 'that for purposes of judicial review of state highway legislation, size restrictions might be deemed inherently tied to public safety. . . .' 417 F Supp, at 1360. The language relied upon does not go so far, and it antedats the era of the limited-access, four-lane divided

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29. . . . (Continued from page 18)
(A. 628) The reference appears to be to twins. As the Governor conceded, however, the reference is actually to large commercial vehicles generally. (A. 184) CF Exhibit 34, Appendix M, Tr. 927, contains a detailed discussion of the facts stated in the Governor's veto message. The discussion was prepared by the Iowa DOT.

[30] "Wisconsin's chief concern over the safety hazards is the safety hazard posed by an extra ten feet of truck length. Length bears an obvious relation to safety. Since longer vehicles or even triple trailers might be shown to be safe, the decision as to what length to permit involves judgment and discretion. The courts should leave this decision to the legislature and should not substitute its judgment for that of the legislature." Brief for Appellees in *Raymond* at 2.

> highways involved in this case. Size restrictions, like other highway safety regulations, are entitled to a strong presumption of validity, but this presumption cannot justify a court in closing its eyes to uncontroverted evidence of record." 434 U.S. 429, 44 n. 19.

Nor is it consonant with the general principle that Commerce Clause cases require a determination of the facts by the trial court, *Great Atlantic* & *Pacific Tea Company v. Cottrell*, 424 U.S. 366, 372 n. 6 (1976).

The facts show that Iowa's length limit does not promote safety. The District Court found the evidence to be "conclusive" that 65-foot twins were as safe or safer than 60-foot twins or 55-foot semis. Appellants, however, argue that this factual contradiction should be ignored for two reasons.

First, they assert that the comparison is inappropriate. They assert that Plaintiff should have to prove that length limits in general never promote safety. CF does not contend that length limits never promote safety, nor does it contend that Iowa does not possess the power to impose length limits. It does contend that Iowa's prohibition of 65-foot twins is impermissible because Iowa's prohibition does not promote safety. CF has shown by massive evidence that the 65-foot twin is as safe, or safer, than the vehicles Iowa routinely permits. That comparison is proper as those vehicles are conceded to be safe and are the vehicles that Appellants suggest CF should use in lieu of 65-foot twins.

Appellants advance a second reason why the presumption should be irrebuttable. They argue that there is a grey area in which small differences in length make little difference in safety. Thus, the state may be unable to offer proof that the small difference in length affects safety. If, however, a number of cases are brought, each arguing for a slightly longer length, the end result may be a large increase in length and an impact on safety which was not discernible at each step.

It is an argument that ignores a prominent fact in this case. The 65-foot twin in this case is a standard vehicle for transportation of general commodities. That fact makes the burden of Iowa's ban great and brings the Commerce Clause into play. The 65-foot twin can be interchanged, other trailer lengths cannot. It can be used in most states, including all of the states adjoining Iowa; longer lengths cannot. As a result, the ban disrupts and fragments a national transportation system. No other twin trailer length is standard and, correspondingly, no other length can be successfully argued for. If CF were to bring a case arguing for 66-foot twins rather than 65-foot twins, the case would not be viable. Though it might be unlikely that any safety difference could be shown, it would also be impossible to show a burden on interstate commerce of the magnitude and type necessary to sustain a challenge on Commerce Clause grounds.

Appellants' own example illustrates the point. Appellants posit a challenge to Iowa's width limitation of eight feet by someone wishing to operate a vehicle 8 feet 3 inches wide, Appellants' Br 12-13. That challenge would fail because 8 feet is the near universal standard to which all large commercial vehicles are built. No burden on interstate commerce could be shown. However, if Iowa initiated a width limit of 7 feet 11 inches, the burden on interstate commerce would be massive. The safety advantage, if any, would be negligible. Presumably, the regulation would fall under a Commerce Clause challenge. The differentiating factor is the burden placed on interstate commerce. It is that factor that makes impossible the "nibbling" process feared by Appellants.[31]

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[31] Indeed, Appellants' argument on twins goes too far. If, in fact, there is a grey area within which there is no discernible difference in safety between the 65-foot twin, the 60-foot twin, and the 55-foot semi, Iowa's length limit becomes insupportable. Appellants' Br., 12-13, 32. No safety advantage is gained, yet interstate commerce is heavily burdened. Even considered under the test stated in *Raymond*, such a regulation must fall. See also, *Bibb v. Navajo Freight Lines, Inc.*, 359 U.S. 520, 529-530 (1959).

B. Appellants' Claims Of Proper Deference To The State Legislature Misapprehend The Commerce Clause And The Facts Of This Case.

Appellants and Amici contend that Iowa's legislative judgment in banning 65-foot twins is entitled to great deference. That deference is defined as upholding the Iowa regulation unless it is irrational, a test derived from Due Process Clause cases. That reliance on the due process test is misplaced and misapprehends completely the Commerce Clause. The Commerce Clause and Fourteenth Amendment are not redundant.[32]

This Court will determine for itself the effects of state legislation which regulates interstate commerce.[33] Here, the effects are not contested. The twin trailer traffic affected by Iowa's ban is almost entirely interstate through traffic. (A. 175-176, 560, 582-583; Tr. 25) It is of little or no benefit to Iowa. (A. 601, 626) By forcing this traffic to divert around Iowa, Iowa achieves local benefits, notably a reduction in traffic and a corresponding decrease in congestion, roadwear, and accidents occurring in Iowa.

We do not suggest that Iowa has acted irrationally in banning twin trailers. From Iowa's viewpoint, the action is entirely rational. From that viewpoint, the local benefits of the ban far outweigh its local harms. Such a judgment, however, is not reviewed under substantive due process grounds or under equal protection grounds. The Commerce Clause, for entirely different reasons, prohibits such judgments by the state legislature:

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[32] "Local regulations which would pass muster under the Due Process Clause might nonetheless fail to survive other challenges to constitutionality that bring the Supremacy Clause into play. Like any local law that conflicts with federal regulatory measures, [citations omitted] state regulations that run afoul of the policy of free trade reflected in the Commerce Clause must also bow." *Bibb v. Navajo Freight Lines, Inc.*, 359 U.S. 520, 529 (1959).

[33] "This court will determine for itself what is the necessary operation and effect of a state law challenged on the ground that it interferes with or burdens interstate commerce. The name, description, or characterization given it by the legislature or the courts of the state will not necessarily control. Regard must be had to the substance of the measure rather than its form." (Citations omitted) *Lacoste v. Department of Conservation*, 263 U.S. 545, 550 (1924), quoted with approval, *Hughes v. Oklahoma*, 441 U.S. 322, 336 (1979), *semble*, *Hunt v. Washington State Apple Advertising Commission*, 432 U.S. 333 (1977).

> "The commerce clause, by its own force, prohibits discrimination against interstate commerce, whatever its form or method, and the decisions of this Court have recognized that *there is scope for its like operation when state legislation nominally of local concern is in point of fact aimed at interstate commerce, or by its necessary operation is a means of gaining a local benefit by throwing the attendant burdens on those without the state.* It was to end these practices that the commerce clause was adopted." *South Carolina State Highway Department v. Barnwell Bros.*, 303 U.S. 177, 185-186 (1938) (citations omitted) (Emphasis added).

The record here clearly demonstrates why such judgments cannot be entrusted to the state:

> "Q. Overall, there would be fewer miles of operation, fewer accidents and fewer fatalities [if the Iowa ban were lifted]?
> A. [Director Kassel] Yes, on the national scene.
> Q. Does it not concern the Iowa Department of Transportation that banning 65-foot twins causes more accidents, more injuries and more fatalities?
> A. Do you mean outside of our state border?
> Q. Overall.
> A. Our primary concern is the citizens of Iowa and our own highway system we operate in this state." (A. 281)

* * *

> "Q. The conclusion of your veto message in 1974 was basically that sixty-five foot twin trailers were a greater

> advantage to interests outside the State of Iowa and would not have much benefit to the interests inside the State of Iowa. Is that a correct statement of that position? position?
>
> A. [Governor Ray] I view my job as one to protect the best interest of the people of my state, and in doing so, I have to take into consideration, I think, the safety, the well-being, and the convenience of the people that live here. . . ." (A. 185-186)

The legislative judgment here is not entitled to deference. The viewpoint is too narrow, the constituency too small. Iowa is inherently incapable of properly judging its ban in a national context. To assume, as Appellants blithely do in their brief, that the legislature is determining the finest of safety differences among various vehicles, is to assume that the legislature will not recognize and act for the benefit of its constituents.

There may properly be grounds for deference to a legislative judgment where that judgment is predicated on balancing harms and benefits occurring alike to state and national interests. No deference is due where the harm is predominantly national and the benefit local.

C. The Inaction Of Congress Does Not Alter The Test To Be Applied In This Case.

The briefs of Appellants and amicus AAR have included materials relating to various congressional debates on truck size and weight limits.[34] Amicus AAR goes on to suggest that the comments of individual senators are appropriate to determine what congressional intentions are.[35] Lost in the mass of material is the simple, salient, and pertinent fact: "Congress has considered preempting this field, but has not acted." *Raymond v. Rice*, 434 U.S. 429, 442 n. 17 (1978). In such an instance, Congress has "left it to the courts to formulate the rules . . . interpreting the commerce clause . . ." *Southern Pacific Co. v. Arizona*, 325 U.S. 761, 770 (1945).

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[34] The confusion of debates regarding vehicle length with those regarding vehicle weight appears intentional. CF seeks no weight increase in Iowa and would not generally benefit from any increase in maximum allowable weights inasmuch as the cargo space of twins is generally filled.

[35] Amicus repeatedly quotes former Senators Gore and Kerr in support of its views. Comments of individual legislators are, however, not competent evidence to show the intent of Congress. *Duplex Printing Press Co. v. Deering*, 254 U.S. 443, 474 (1921).

The suggestion that Congress has accommodated itself to the role of the Supreme Court is particularly apt here. This Court decided *Raymond* in 1978. Had Congress believed *Raymond* not to express its intent, it could have passed legislation overruling that case. It has chosen not to do so.

III. SAFETY

A. The Safety Evidence Convincingly Supports The District Court's Findings.

As this Court has reiterated, the trial court must determine the "total effect" of the law as a safety measure. *Southern Pacific, supra, Bibb, supra, and Raymond, supra.* The District Court found:

> "The evidence convincingly, if not over-whelmingly, established that the 65-foot twin is as safe as, if not safer than, the 60-foot twin and the 55-foot semi.
>
> * * *
>
> "Defendants claim that the evidence is inconclusive on the relative safety issue, and it is a reasonable policy decision for Iowa to make a safety distinction between twins and semis. Defendants argue that they should prevail because of the strong presumption. The Court cannot accept this argument as it believes that the evidence clearly establishes that the twin is as safe as the semi."475 F.Supp. 544, 548-549 (J.S. 21a-22a).

The Court of Appeals noted that the District Court's findings on twin safety were "based . . . on a record replete with substantiating evidence." 612 F.2d 1064, 1069 (J.S. 8a).

The affirmative case on safety was stronger than that in *Raymond*; and the rebuttal, though full of sound and fury, was of the same type held insufficient in *Raymond*. The telling fact is that Appellants were unable to produce a single expert that took direct issue with the trial court's findings as to overall safety. 475 F. Supp. 544, 549 (J.S. 21a); 612 F.2d 1064, 1069 (J.S. 7a-8a). Neither the Appellants nor any witness presented by Appellants could or would state an opinion as to the relative overall operational safety of twins and semis.

The affirmative safety evidence included:

- A comprehensive study of 65-foot twins prepared by the Iowa Department of Transportation;
- Testimony of state, federal, and insurance officials who had actual experience with 65-foot twins;
- Engineering testimony on vehicle and highway safety characteristics;
- Accident statistics prepared by governmental agencies and a detailed analysis of CF's own statistical record; and
- An expert analysis of the relative overall safety of twins and the adverse safety effect of Iowa's ban.

The 1975 Iowa DOT Study.[36] This comprehensive study, unavailable at the time of *Raymond*, isolated and evaluated an exhaustive range of issues concerning 65-foot twins in Iowa. The study concluded, *inter alia:*

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[36] The study was done at the request of the Iowa legislature. The Iowa DOT considered it objective and exhaustive. (Tr. 11-23, 70-71) Following the study, the Iowa Transportation Commission adopted a rule which would have permitted 65-foot twins in Iowa without restriction to Interstates, provided the state legislature banned studded snow tires. (A 555-556, 559-560) The rule was invalidated because of the tie to legislative action. *Motor Club of Iowa v. Department of Transportation*, 251 N.W. 2d 510 (1977).

> "Sixty-five foot twin trailer combinations have *not* been shown by experiences in other states to be less safe than 60 foot twin trailer combinations *or* conventional tractor-semitrailers.
>
> * * *
>
> ". . . In reviewing accident statistics, no figures show a significant difference in accident experience that would indicate an expected higher accident or fatality rate for 65 foot twin trailers. The analysis of maneuverability, splash and spray and aerodynamic distrubance characteristics indicated no sacrifice to safety. An in-depth analysis of Missouri's accident records likewise failed to show any significant difference in accident experience among these truck types." (A. 584-585)

The safety conclusions of the Iowa Department of Transportation were independently confirmed in a similar study in the State of Virginia in 1970.[37]

Federal, State and Insurance Officials. The federal and state officials who testified all had practical experience with the safety of large commercial vehicles. The only dispute among them was whether twins are safer than, or merely as safe as, semis:

> Kenneth L. Pierson, Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration:
>
> "Q. What has the safety experience of the Bureau of Motor Carrier Safety been with respect to 65-foot twin trailers as opposed to tractor semitrailer combinations of 55-foot.
>
> A. According to the data available to the Bureau, 65-foot twin combinations are as safe as, if not safer

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[37] The Virginia Study concluded: "Twin trailer combinations, not exceeding 65 feet in length and conforming to existing width and weight limitations, may be operated safely and efficiently on four-lane divided highways without interfering with the safety and convenience of motorists." (A. 644)

than, the standard tractor semitrailer configuration." (A. 23)

Ernest G. Cox, retired Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration:

Q. What is that opinion?

"A. My opinion is [that it is] decidedly superior from a safety standpoint to have goods transported in a combination of two trailers with a 65 foot limitation than in a single trailer such as is possible with a 55 foot limitation." (A. 45)

Similar testimony was given by state officials.[38]

Appellants presented no testimony of any state or federal official with comparable experience with 65-foot twins and no testimony contrary to the observations of these witnesses.[39]

The Director of Safety and Engineering for Transport Indemnity Company, an insurer of large commercial vehicles, reaffirmed his previous testimony in *Raymond*:

"Q. What has the safety experience with Transport Indemnity Company been with respect to the 65-foot twin trailers as opposed to 55-foot tractor semitrailers?

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[38] Maj. James Adkins, Kansas Highway Patrol (A.67); Col. James Crawford, Chief, Minnesota State Patrol (A. 56); Thomas Doyle, former Director-State Engineer, Nebraska Department of Roads (A. 82-83); Col. Dennis Eisnach, Superintendent of the South Dakota Highway Patrol (A. 87-88); Edward Kynaston, Deputy Chief Commander, California Highway Patrol Enforcement Services Division (A. 50); Francis C. Marshall, Assistant Commissioner of Minnesota DOT (A. 59); Claud McCamment, Retired Director, Kansas Highway Commission (A. 74-77); and George Moberly, Engineer of Traffic, Illinois Department of Transportation (A. 62-63), Arlan Hicks, Transportation Safety Administrator, State of Kansas (A. 70).

[39] Appellants produced testimony that the Kansas Turnpike Authority, a state-chartered corporation, closed to "doubles" under snow and wind conditions. Cross-examinations revealed that the purpose for this blanket closing rule under such conditions is to exclude 108-foot double semis and not 65-foot five-axle twins, the latter being excluded only as a matter of administrative convenience. (A. 230-233)

A. No difference. The doubles — we use the word doubles here on the West Coast might be slightly safer than the semis." (A. 89)

The Iowa DOT Study includes similar statements from virtually all major truck insurance carriers. (A. 594-596; CF Ex. 2, p. 77-80, Tr. 107-108)

Engineering Testimony. CF presented exhibits and experts who testified on various vehicle safety characteristics, such as braking, component reliability, structural integrity, maintenance, passing, splash and spray, turning and off-tracking, and stability.[40] The expertise of these witnesses was generally derived from their job experience, not preparation for trial, and contrasted sharply with the expertise of the defense witnesses.

CF also presented a "level of service" analysis of highways which would be affected by permitting 65-foot twins on Interstates in Iowa. Level of service analysis is a specialized field of highway safety engineering which involves application of objective standards for measuring "congestion," highway capacity, and serviceability for various traffic flows.[41] The study concluded that there is less safety hazard with operation of trucks on Interstate 80 in Iowa than U.S. 36 in Missouri, even without considering the reduction in vehicle miles by operating over the more direct route through Iowa. Shifting 65-foot twins from U.S. 36 will improve conditions on that highway without imposing a measurable difference in the level of service of Interstate 80. (A. 632-635)

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[40] *Braking:* A 135-139; for technical details and specifications not printed in the Appendix, see deposition of George Ternent, generally, and blueprints at Ternent Depo. Ex. 1 (Depositions, deposition exhibits, and CF Ex. 71 cited hereinafter are all part of Court Exhibit 3, Tr. 1312); A. 99, 103-104, 143-144, 343-345; CF Ex. 71, pp. 6, 81. *Component reliability:* A 339-340, 342; e.g., Ternent Depo. 45-46, 131. *Maintenance:* Tr. 745-749, 769-770, 773-776, 779-784; CF Ex. 32 pp. 6-11, Tr. 927. *Passing:* A 102-103, 116, 567, 590-591; CF Ex. 71 pp. 64-75. See also footnote 49, infra. *Splash and spray:* A. 95-96, 108; Sherard Depo. Ex. 2 and 3. *Turning and off-tracking:* A. 97, 116, 585; Tr. 56-57; CF Ex. 2 pp. 61-62, Tr. 108; CF Ex. 71 pp. 6, 40. *Stability:* A. 98-99, 116-117, 149-153, 561-577, 585; CF Ex. 71 pp. 39-41, 76-81. References include "engineering" evidence, only.

[41] The analysis included a field survey of Interstate 80 in Iowa and principal diversion routes around Iowa, via U.S. 36 through Missouri. The procedures are recognized by the federal government and all 50 states. (A. 386-387; Tr. 1095) For a general description of the analysis, see CF Exhibit 54, Tr. 1234 and Transcript pages 1094 to 1113. Appellant Kassel acknowledged the procedure to be a recognized standard and the qualification of the firm that prepared the analysis. (Tr. 140, 142-143) The Director of the Iowa DOT Highway Division, Mr. McLean, was essentially in agreement with the analysis of Interstate 80 in Iowa. (Compare, Tr. 1119-1120 and A. 434)

Statistical Studies. Eight studies were presented. Two were discounted by both CF and Appellants.[42] Two were essentially surveys of accident data conducted by Iowa DOT: one, a survey of accident records of surrounding states; the other, a survey of accident records of 15 carriers operating both twins and semis. The four principal statistical studies included:

1. A U.S. DOT Bureau of Motor Carrier Safety [BMCS] study based on eight years of data over three *billion* miles of operation, comparing relative accident, injury, and fatality rates for 65-foot twins and 55-foot semis. (A. 32-36, 586, 609)

   Twins were found to have significantly fewer accidents, injuries, and fatalities per mile of operation than semis. Although the BMCS study did not control for certain potential biases, the results of the studies with more controlled conditions suggest no bias sufficient to distort the outcome of this very large study. (A. 304-305)

2. CF accident statistics, 1970 through 1978. (A. 608) For the nine years, the data showed twins to be significantly below semis in accident rates with no significant difference in injury or fatality rates. (Tr. 413-414)

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[42] A California Highway Patrol Study and the "Reiss Study" (also known as the "BioTechnology" or "Bio-Tech" Study, properly titled "Comparison of California Accident Rates for Single and Double Tractor Trailer Combination Trucks") were so defective that CF highway safety expert, Dr. Glennon, concluded that they should be disregarded. (A. 295) Dr. Koehler, Appellants' statistical expert, concurred. (A. 489-490) Appellants properly make no mention of the former; their attempt to now revive the "Reiss Study" is discussed at page 39, infra.

3. Detailed analysis of CF's 1978 accidents (CF Ex. 11, Tr. 375; CF Ex. 12, Tr. 375; CF Ex. 13, Tr. 375; CF Ex. 18, Tr. 486; and A. 607-613)

   In 1978, CF's semis had 2% more accidents, 27% more injuries, and 82% more fatalities per mile of operation than CF twins. The 1978 CF data was analyzed extensively for biases and was found to contain no bias favoring twins (A. 610-613).

4. A "Matched Pair Analysis" which compared CF semis and twins operating over 112 million miles under identical conditions. (CF Ex. 14, Tr. 375; CF Ex. 15, Tr. 375; and CF Ex. 16, Tr. 375)

   The study was controlled for all potential biases. The result showed no significant difference in accident, injury, or fatality rates, although semis had a markedly higher injury rate. Appellants' own statistical expert, Dr. Koehler, testified that he believed the matched pair analysis provided "moderately strong" evidence that semis cause more injuries than twins. (A. 487-488)

The studies vary in sample size, degree of control of variables, and statistical reliability. They were subjected to extensive scrutiny, examination, and testimony of experts as to possible biases, inaccuracies, or problems. In total, they provide solid support for expert opinions on the safety of 65-foot twins.

The District Court's findings reflect its sensitivity to possible biases in the statistics. The Court placed particular reliance on CF's accident statistics and the "Matched Pair Analysis." 475 F.Supp. 544, 549 (J.S. 21a).

These two statistical studies are highly credible. CF's 1978 accident data provides a large statistical base. (A. 288-290, 299-304, 610-613) The data was admitted by Appellants to be accurate and complete.[43] Dr. Koehler speculated that biases might exist, such as driver, maintenance, or road-type differences. He knew of no facts to support his speculation. The alleged biases were examined either by detailed data analysis or the testimony of witnesses familiar with CF's operations. The alleged biases were disproved. (A. 362, 610-613; Tr. 745-746) The "Matched Pair Analysis," though based on a small sample, was totally controlled to avoid bias.[44]

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[43] "Factual Statements and Responses of Plaintiff and Defendants," Document No. 26, Statement Nos. 335 and 336.

These statistical studies do not constitute the entire safety case and, given the nature of statistical evidence, should not. Every credible statistical study did conclude that twins were either as safe as, or safer than, semis. (A. 608) The District Court was fully justified in deciding that the statistical studies were congruent with other sources of expert evidence and supported its conclusion as to overall safety.

Highway Safety Analysis. To address overall safety, Dr. John Glennon, a nationally recognized authority on highway safety, performed a three-stage analysis of the safety of 65-foot twins. He conducted an extensive search and analysis of the literature available, numerous analyses of available accident data, including computer analyses of CF's data, and developed analytical methods to eliminate possible biases in accident data. (A. 289-290, 609-613; CF Ex. 18, Tr. 486; CF Ex. 19, Tr. 375; CF Ex. 20, Tr. 375; and, CF Ex. 21, Tr. 486) He concluded that twins were certainly as safe as semis. (A. 289, 304)

Dr. Glennon's opinion as to the relative overall safety of twins is in stark contrast to the inability or unwillingness of any of Appellants' experts to express an opinion on relative overall safety of the vehicle.

There was one safety conclusion by Dr. Glennon with which everyone agreed: added miles required to circumvent Iowa because of the Iowa ban result in a greater number of accidents, injuries, and fatalities than would result if 65-foot twins were permitted on Interstates in Iowa.[45] (A. 305-306, 614; Tr. 480-

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[44] A. 476-477; Tr. 1788-1789; 475 F. Supp. 544, 554 (J.S. 33a)

[45] Appellant Kassel, Director of the Iowa DOT (A. 270-271); the Iowa

. . . (Continued on Page 33)

482) This fact was without dispute, and the Court finally cut off further questions on the subject as being repetitious.[46]

B. Appellants' Attack on the Factual Findings Relies on Isolated Segments of the Record Which Themselves Fail to Support Appellants' Contentions.

Appellants do not frontally attack the validity of the District Curt's findings. To support their position, Appellants make assertions about the facts on five subjects: passing, intersections, backing, jackknives and upsets, and accident and fatality rates, Appellants' Br. 5, 26-27. Appellants cite "facts" without regard to context. They disregard elaborations and qualifications by the witnesses, impeachment, concessions on cross-examination, and other evidence of record. Appellants not only depart from but effectively abandon any acknowledgment that factual findings be on "the entire evidence." *Zenith Corp. v. Hazeltine*, 395

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45. . . . (Continued from Page 32)

DOT Study (CF Ex. 2, p. 25, Tr. 107-108; A. 604); Col. Edward Dickinson, Chief, Iowa State Patrol (A. 402); Kenneth L. Pierson, Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration (A. 25); Ernest G. Cox, retired Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration (A. 44); George E. Moberly, Engineer of Traffic, Illinois DOT (A. 63-64); Arland V. Hicks, Transportation Safety Administrator, Kansas Department of Transportation (A. 71); Thomas D. Doyle, former Director — State Engineer, Nebraska Department of Roads (A. 83-84); John Nimmo, Iowa DOT (A. 250); Fred J. Myers, Professional Engineer (A. 117-118).

[46] Professor Robert L. Carstens, professor of civil engineering, Iowa State University (defense witness):

"Q. Would you agree with the proposition that reduction in number of miles tends to reduce exposure to accidents, generally?

A. A reduction in the number of miles a vehicle travels tends to reduce exposure to accidents?

Q. Yes, sir.

A. Yes, I would agree.

Q. And would you agree that the interstate system would generally be a safer facility on which to operate —

THE COURT: Mr. Varda, let's not get into these things that there doesn't seem to be any question about, because that is repetitious. If you want to get into an area — But going over with every witness matters that don't seem to be in issue is what I mean by repetitious." (A. 462)

U.S. 100, 123 (1969).[47]

Passing. Appellants' assertions rest solely on the testimony of Appellants' witness Peters. Appellants' Br. 5, 26. (A. 504-505) Dr. Peters' testimony regarding the significance of the additional ⅓ of a second required to pass a 65-foot twin, particularly in adverse weather, was based on his off-hand personal observations.[48]

The evidence contrary to Dr. Peters' testimony is extensive and demonstrates that the slight difference in passing time and distance is not significant to safety, particularly on Interstates.[49] The 1975 Iowa DOT Study concluded:

> "The data shows that a slight increase in length has no significant impact on the passing distance." (A. 591)

The District Court could properly disregard Dr. Peters' testimony.[50]

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[47] Appellants believe they need only make a colorable argument. Appellants' Br. 17. *Contra*, 612 F.2d 1064, 1069 (J.S. 6a).

[48] The District Court found Dr. Peters not entitled to express an opinion on splash and spray other than that of a layman. 475 F.Supp. 544, 554-555 (J.S. 34a). Splash and spray characteristics vary with vehicle types. Twins produce 20% less than semis. These findings have been verified by a number of research agencies. (A. 95-97; Sherard Depo. Ex. 2 and 3)

[49] Without exception present and former governmental officials who are familiar with 65-foot twin operations found no effect on passing safety, particularly on Interstates: Adkins, Kansas Highway Patrol (A. 68); Crawford, Minnesota Highway Patrol (A. 57); Doyle, Nebraska Highway Department (A. 83); Eisnach, South Dakota Highway Patrol (A. 88); Gilles, Kansas Turnpike Authority (A. 232); Hicks, Kansas DOT (A. 72-73), Kynaston, California Highway Patrol (A. 51-53); McCamment, Kansas Highway Commission (A. 76, 79); Pierson, U.S. DOT, Bureau of Motor Carrier Safety (A. 25). The engineering evidence concurs with their opinions, see footnote 40, above. In reality, as a result of continued acceleration during passing, the actual differential is smaller than that calculated. (A. 102-103; Tr. 1126-1127)

[50] In *Raymond*, Wisconsin similarly asserted that passing longer trucks poses obvious hazards, paticularly in adverse weather, arguing that, "the safety factors are obvious." This Court found the Wisconsin ban to provide only "... the most speculative contribution to highway safety." 434 U.S. 429, 447 (1978).

Intersections. Appellants rely solely on a portion of the testimony of Prof. Carstens. For his testimony in this proceeding, Prof. Carstens designed a special methodology to measure and compare the very small time differences required for 60-foot and 65-foot vehicles to cross a selected type of intersection. (Tr. 1549-1551) The methodology required the unrealistic assumption of random entry and uniform acceleration into various assumed levels of traffic flow.[51]

The difference to which Prof. Carstens attached the greatest significance required an extremely heavy hypothesized traffic flow of 2,000 vehicles per hour. (Tr. 1537) Under his assumptions, a 60-foot vehicle could not cross the hypothetical intersection for one week; a 65-foot vehicle, for 10 days.[52] After detailed review and discussion, the District Court found that Prof. Carstens' ". . . charts, tables and plats were all interesting but of little practical value." 475 F.Supp. 544, 555 (J.S. 35a).

Placing Appellants' claims in context destroys the illusion of concern for intersectional safety. Interstates do not have intersections; only those intersections affected by access to Interstates are at issue. Most intersections in Iowa are narrower than Prof. Carstens' hypothetical intersection. (Tr. 1578) For most tighter intersections, the superior maneuverability of both 60 and 65-foot twins provides an edge over 55-foot semis.[53] Iowa permits 65-foot twins at all intersections within the commercial zones of its border cities. Finally, as Prof. Carstens conceded, exposure to the type of accident about which he expressed concern is far greater on two-lane facilities, such as CF's route

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51. A. 453. The limited field observations from which Prof. Carstens extrapolated his comparative data showed a variation of 1,288% in actual acceleration times. (Tr. 1611-1612) Prof. Carstens conceded that acceleration varies with driver reaction to traffic flow and that the small time differences which he attempted to compare disappear with minor differences in acceleration. (Tr. 1607-1610)

52. The difference is calculated from Prof. Carstens, Tr. 1534-1538, A. 457-459.

53. Iowa DOT Study, CF Ex. 2, pp. 61-62, Tr. 107-108; Appellant Kassel, A. 274.

around Iowa via U.S. 36 in Missouri, than on Interstates in Iowa. (Tr. 1555-1556)

Backing. Appellants' concern rests solely on a portion of the testimony of Col. Dickinson, Chief of the Iowa State Patrol, Appellants' Br. 5, 27. (A. 399-400) Col. Dickinson conceded that all of the problems addressed in his testimony other than backing are problems associated with large trucks generally. (A. 403) His testimony was typical of efforts of the defense to confuse the issue of the safety of 65-foot twins with that of other vehicles. Col. Dickinson had no opinion as to the relative safety of 55-foot semis and 65-foot twins. His concern with backing was his *only* safety concern with either 60-foot or 65-foot twins. (A. 403)

Col. Dickinson's concern with backing was entirely and admittedly speculative and related to vehicle configuration, not length. He had the same concern with 60-foot twins.[54] (A. 403) Col. Dickinson did not know how far a twin can be backed, but conceded that backing capability sufficient to clear an accident would negate his concern. (A. 404)

Other evidence demonstrates that twins can be backed sufficiently to clear an accident in a critical situation.[55] No witness testified that backing is an actual problem. Furthermore, Appellants' asserted concern finds no application in practice since in this regard 60-foot twins are the same as 65-foot twins and are permitted on all highways in Iowa. The District Court's findings are consistent with Col. Dickinson's entire testimony and other evidence on the subject.

Jackknives and Upsets. The District Court's entire findings on this subject, cited only in part at pages 4-5 and 28 of Apellants' brief were:

> "Twins and semis have different characteristics. Twins are more maneuverable, are less sensitive to wind, and

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[54] Compare Appellants' brief, pp. 7-8 stating Iowa's sole concern to be length.

[55] The Virginia Twin Trailer Study, CF Ex. 71, p. 81; A. 103.

> create less splash and spray. However, they are more likely than semis to jackknife or upset. They can be backed only for a short distance. The negative characteristics are not such that they render the twin less safe than semis overall. Semis are more stable but are more likely to 'rear end' another vehicle.
>
> * * *
>
> "There is an indirect relationship between maneuverability and stability. The more maneuverable a vehicle is, the less stable it becomes. In the case of semis, some maneuverability has been sacrificed for greater stability. In the case of twins, some stability has been sacrificed for greater maneuverability. These choices do not mean that either vehicle is unsafe or that one is less safe overall than the other." 475 F.Supp. 544, 549, 555 (J.S. 21a, 35a).[56]

Appellants attempt to relate the District Court's findings to CF's statistics which show many more jackknives and upsets for twins than semis. Jackknives and upsets are closely related to ice and snow conditions, to which CF twins have greater exposure than do CF semis. (A. 302-303, 316-317, 357-359) Not surprisingly, experts for both CF and Appellants attributed this large variation to differences in weather exposure: twins operate more miles under adverse weather conditions. (A. 316-317, 493-494)

Experts testified that the actual difference in jackknifing was of no practical significance. After years of winter tests of articulated vehicles on slippery surfaces, Dr. A.E. Easton, former Chairman of the Committee on Winter Driving Hazards of the National Safety Council, reported in his 1972 paper, "Jackknifing of Articulated Vehicles on Slippery Surfaces": "The general conclusion then is that the safety of the 55-ft. tractor semitrailer and the 65-ft. twin-trailer combinations is not significantly different." (A. 153) State officials from Minnesota and South Dakota, which suffer harsh winter conditions, indicated no handling problems with 65-foot twins in ice and snow. (A. 59, 88) A California official made a similar observation about twins operating in severe weather in the Donner Pass area. (A. 50)

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[56] Appellants raised the issue of stability by presenting evidence concerning stability of a unique Michigan double tanker vehicle, but no comparison among the types of vehicles involved in this proceeding. (A. 134, 534-538) Appellants' expert argued that this evidence was germane because no data was available on 65-foot van-type twins. (A. 530-531) CF's rebuttal witness Walgrave had actually been involved in testing of stability characteristics of articulated vehicles while an employee of the Illinois Institute of Technology Research Institute. The testing included measured dynamic tests of 65-foot twins and 55-foot semis operating through emergency maneuvers, which were used to refine and validate computer models. (A. 561-566) He testified that 65-foot twins are slightly less stable but are more maneuverable than 55-foot semis, and that both vehicles are adequately stable. (A. 566-567)

The District Court correctly found some difference in characteristics between twins and semis and could ascribe some part of the gross difference in accident types to that difference. It regarded the difference to be of no practical significance, since the reason is a design trade-off which favors twins with greater maneuverability. (A. 562-563) Semis have more accidents in categories other than jackknives — rear-end collisions, turning accidents, passing accidents. Jackknives rarely cause injuries, whereas the type of accidents more common to the less maneuverable semis often involve other vehicles and result in injuries. (A. 301-302, 306-307; CF Ex 18, pp. 9-10, Tr. 486)

The District Court's conclusion is also confirmed by the fact that the 60-foot twin, less stable than either the 55-foot semi or the 65-foot twin, was described by Appellant Kassel as a very safe vehicle. (Tr. 139, 240; *compare*, A. 571) In terms of both stability and maneuverability, a 65-foot twin thus falls between two vehicles recognized by Iowa as safe.

Accident and Fatality Rates. Appellants claim to have offered "additional studies" and data from CF's own records which "raised questions" about whether twins had higher fatality rates and more frequent accidents in which property damage occurred, Appellants' Br. 4. In these references, Appellants' abandonment of propriety in recounting the facts to this Court is complete.

The "additional studies" are a single report, known as the "Reiss Study."[57] Experts for both Appellants and CF found the Reiss study so faulty that it should be disregarded. (A. 295, 489-490) Both the principal author and the federal official responsible for overseeing preparation of the study would not vouch for its accuracy nor sponsor it to a court as a measure of relative safety of 65-foot twins and 55-foot semis. (A. 205-206, 225-226)

The Reiss study calculated accident, injury, and fatality rates for twins and semis based on 1974 California Highway Patrol accident data. Mileage was based on vehicle counts at weigh stations on rural and urban highways. A higher proportion of the total semis than the total twins was counted at the urban stations. The California Highway Patrol accident data, however, was almost entirely (98%) from rural highways. Semis were accorded miles of exposure on urban roads, on which no accidents could be reported. As a result, the semi accident, injury, and fatality rates were understated. This bias was first noted by Dr. Hedlund of the National Highway Traffic Safety Administration prior to this proceeding. (Tr. 520) Experts Glennon for CF and Koehler for the Appellants concurred in Dr. Hedlund's criticism. (A. 295, 489-490) Removal of the bias by using only the rural counting stations gave results showing no significant differences between semis and twins. (A. 214, 308-309; Tr. 520-522)

Appellants' second reference, principally to Appellants' Exhibit 546, "Comments on Road Accidents Reported by Consolidated Freightways in 1978," (A. 668-675) sponsored by Dr. Koehler, is more remarkable for its dissimilitude. Dr. Koehler

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[57] Appellants assert that they showed the generally safety case to be inconclusive, pointing out flaws in statistical studies and introducing their own studies. Appellants' approach to this statistical evidence is at best disingenuous. They assert that many of the studies are defective and that they produced studies showing twins to be less safe than semis. Both statements are true, but closely connected. As the experts *on both sides agreed*, the studies which Appellants rely upon to show twins to be less safe were the defective ones.

"raised questions," but he also put them to rest. At trial, Dr. Koehler effectively disowned his own exhibit.

In Exhibit 546, Dr. Koehler used a dollar cut-off for the accident count. Both he and Dr. Glennon agreed that such cut-offs bias the statistics against twins.[58] An accident of the same magnitude will generate more dollar damage to a twin than a semi.

In addition, apparently as a result of outside instruction to Dr. Koehler, the semi accident rate calculation in Exhibit 546 excludes accidents involving "broken down doubles" (short semis) but includes their mileage as semi miles. (Tr. 1743-1745) The result, as Dr. Koehler conceded, is to understate semi accident rates in numerous tables in Exhibit 546. (Tr. 1742-1747) Acting on the advice of counsel, Dr. Koehler excluded from Exhibit 546 any comparisons of accident types favorable to twins. (A. 492-493)

Exhibit 546 warns of the very "manipulations" of accident data, by choice of reporting criteria or categorization, of which the exhibit is guilty. Dr. Koehler forthrightly admitted his exhibit was not a fair comparison and that rates shown are "not very meaningful." (Tr. 1678) Dr. Koehler also confirmed that CF had not "manipulated" any data. (Tr. 1734-1735, 1771)

Conclusion. The "facts" cited by Appellants to support Iowa's ban of 65-foot twins do not even make the "colorable" showing they posit. Although Appellants hotly contest each evidentiary issue and refuse to concede any material matter, no legitimate local interest beyond the speculative or illusory has been advanced. The claims of support in the evidentiary record now advanced by Appellants only illustrate the soundness of the District Court's findings.

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[58] Dr. Glennon, (A. 298-299); Dr. Koehler, (A. 491). The record includes extensive foundation: (Tr. 417-422, 428-429; CF Ex. 46, pp. 1-2, Table L-3, Tr. 1033; CF Ex. 18, pp. 5-8, 10, Tr. 46) In 1978, a cut-off of $250 damage to CF equipment would result in counting 53% of the twin but only 38% of the semi accidents. In 1978, CF semis had a higher percentage of injury and fatality producing accidents than did CF twins.

The absence of legitimate substance to Appellants' safety objective in banning 65-foot twins becomes all the more apparent in the full context of Iowa's vehicle size regulations.

IV. DISCRIMINATION.

The determination of whether safety advantages outweigh economic costs is a political determination. Though this Court has consistently reserved the power to strike down overly burdensome safety regulations,[59] in general it has relied upon the local legislative process to do so, particularly in highway matters. The Commerce Clause's proscription against discrimination is assumed to ensure that the state legislature will be forced to balance both state and national benefits and harms:

> "The present regulations, or any others of like purpose, if they are to accomplish their end, must be applied alike to interstate and intrastate traffic both moving in large volume over the highways. The fact that they affect alike shippers in interstate and intrastate commerce in large number within as well as without the state is a safeguard against their abuse." *South Carolina State Highway Department v. Barnwell Bros., Inc.*, 303 U.S. 177, 187 (1938).

Even absent legislation that creates exceptions favoring domestic interests, it is questionable whether that assumption is workable where, as here, the burden falls almost entirely on out of state interests. The question of the more general truth of the assumption, however, need not be reached in this case because Iowa exhibits a pattern of exempting state interests from the burden of its length limit.

In *Raymond*, this Court stated that exemptions undercut the "presumption of validity" accorded the state regulation.[60] If that means the exemptions destroy the strong presumption of validity, the reasoning is wrong. The strong presumption of validity serves to protect the safety interest, and the inconsistency of the state should not end that protection. Whether the regulation promotes safety is a matter of fact, and the actions of the legislature do not change facts.

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[59] E.g. *Seaboard Air Line Ry. v. Blackwell*, 244 U.S. 310 (1917).

[60] *Raymond v. Rice*, 434 U.S. 429, 446-447 (1978).

What is undercut is the presumption that state judgment as to the balance between local safety and local economic cost will also serve as a reasonable balance between national safety and national cost. Where the state creates an exemption, it is concluding that the safety advantage, if any, is trivial. That judgment should stand alike for interstate and local interests.

The most telling exemption in this case is the border city exemption, under which 65-foot twins are routinely operated to bring goods into or out of Iowa's border cities.[61] No restrictions are placed on their movement, and they are able to operate on urban Interstates, two-lane roads, and city streets. The exemption secures for many of Iowa's manufacturers the advantages of 65-foot twins, while avoiding the disadvantages of allowing through twin traffic of little benefit to Iowa. The exemption traduces the claims raised in Appellants' brief. If Iowa's concern is intersection maneuvers, Iowa permits 65-foot twins on roads and streets that have far more intersections than the Interstate. If the concern is passing, Iowa permits 65-foot twins on two-lane roads where passing would be far more hazardous. If the concern is backing, Iowa permits 65-foot twins on congested city streets and two-lane roads where the necessity of backing is more likely than on an Interstate. Viewed as a whole, the exemption demonstrates that the Iowa Legislature regards the safety hazard of the vehicle, if any, to be clearly outweighed by economic interests.

Appellants respond by asserting that there is no evidence in the record that the border city exemption mitigates any hardships of Iowa businesses and that the exemption benefits interstate movement. Appellants are apparently unaware of the record and the law.

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[61] Section 321.457(7), Iowa Code (1979). (A. 618) The actual Exemption is for the "commercial zone" of a city. This normally includes nearby areas for which the city serves as a commercial center.

Extensive testimony, largely uncontradicted, shows that aside from shipping rates, shippers able to use twins enjoy faster long-haul service, faster pickup and delivery, and lower exposure to freight loss and damage. Moreover, the record shows that economic benefit to Iowa shippers was the impetus for the border city exemption. In early 1974, the Governor vetoed House Bill 671 which permitted 65-foot twins on all roads in Iowa. In his veto message, the Governor stated:

> "I have heard many arguments in favor of and against this particular piece of legislation. Early in this session, in my special energy and transportation message to the General Assembly, I said there would be '. . . some value both to Iowa industry and to energy efficiency if additional length only could be utilized by trucks originating at, or destined to, points in Iowa.'
>
> "Then, as now, I find sympathy with those who are doing business in our state and whose enterprises could gain from increased cargo carrying ability by trucks. However, with this bill, the Legislature has pursued a course that would benefit only a few Iowa-based companies while providing a great advantage for out-of-state trucking firms and competitors at the expense of our Iowa citizens." (A. 626)

The legislature passed the border city exemption shortly thereafter.

Appellants simplisticly suggest that because shipments to and from Iowa are interstate, there is no discrimination. Laws which achieve advantages for one state's interstate commerce, over the interstate commerce of other states, are perhaps more repugnant to the Commerce Clause than laws that favor a state's interior commerce.[62]

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[62] In effect, the border city exemption is similar to Wisconsin's interplant permit exemption in *Raymond* which permitted the use of oversize vehicles between Wisconsin plants and from the plants to the state line. 434 U.S. 429, 446 n. 24.

The District Court did not state the border city exemption to be directly discriminatory. The court stated that the exemption ". . . is consistent with the state policy of protecting its highways and citizens from additional twin traffic across the state." 475 F. Supp. 544, 552 (J.S. 29a). That policy, the District Court had earlier stated, "has the aura of protectionism usually associated with discrimination against interstate commerce." 475F. Supp. 544, 551 (J.S. 26a).

As Wisconsin did, Iowa has a number of other exemptions expressly limited to activities benefiting Iowa.[63] In Wisconsin, a Wisconsin manufacturer of twins could haul them in tandem out of the state. So may an Iowa manufacturer.[64] In Wisconsin, Wisconsin manufacturers of mobile homes could haul oversize units in the state. In Iowa, mobile homes 60 to 85 feet in length and from 12 feet 5 inches to 14 feet 5 inches may be moved, but only if the destination or origin is in Iowa and only for an Iowa resident.[65] As the Governor stated in vetoing a prior bill that would have allowed oversize mobile homes to be moved regardless of whether for Iowa's benefit:

> "This bill also would make Iowa a bridge state as these oversized units are moved into Iowa after being manufactured in another state and sold in a third. None of this activity would be of particular economic benefit to Iowa." (A. 641)

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[63] See *Raymond v. Rice*, 426 U.S. 429, 446-447, 450 (1978). Iowa, like Wisconsin, also issues numerous "over dimension" permits. In 1977, Iowa issued 9,295 annual and 41,531 single trip permits. Unlike Wisconsin, Iowa does not even require permits for vehicle transporters. Section 321. 457(5), Iowa Code (1979). (A. 618)

[64] Section 321E. 10, Iowa Code (1979). (A. 618) Manufacturers may move 65-foot twins for export on four-lane and two-lane roads, though Iowa restricts them from narrow two-lane roads and limits their speed. If a vehicle is 65 feet or less in length, it is exempted from carrying special warning signs or devices, §321.24, Iowa Code (1979). (A. 621)

[65] Section 321E.28, Iowa Code (1979). (A. 619) Appellants, in their brief, only listed exemptions contained in §321.457, Iowa Code (1979), Appellants' Br. 20.

Appellants contend that length and not configuration is the issue here. If so, Iowa's exemption for loaded vehicle transporters 65 feet in overall length suggests that the safety concern for length is minimal when there is a burden on Iowa consumers.[66]

V. THE BURDEN IMPOSED ON INTERSTATE COMMERCE.

A. The Commercial Burden.

CF responds to the Iowa ban in ways very similar to those necessitated by Wisconsin's ban.[67] Freight that would normally pass through Iowa is either diverted around the state or is transported in 55-foot semis rather than 65-foot twins. Freight originating in or destined to Iowa, other than border cities, is transported in semis or shuttled after splitting 65-foot twins at Iowa's borders.[68] The methods of coping with the ban result in significant delays, added exposure of the freight to damage, increased equipment incompatibility, interference with equipment interchange, and added costs. None of these factors are confined to Iowa. Indeed, because Iowa blocks the transcontinental route connecting the industrial East and Midwest with the West, most of the burden is imposed on through traffic having little connection with Iowa.[69]

Appellants' response to the monetary burden is to assert that it is insignificant and that it is the result of a voluntary business decision by CF to use 65-foot twins rather than 60-foot twins or

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[66] Appellants now contend that there is no evidence that the 65-foot vehicle transporter is a benefit to anyone in Iowa. But see, "Factual Statements and Responses of Plaintiff and Defendants," Document No. 26, Statements 381-383.

[67] *Raymond v. Rice*, 434 U.S. 429, 438-439 (1978).

[68] Generally, CF uses twins for East-West traffic, diverting them around Iowa and uses semis for much of its North-South traffic. For traffic to and from Iowa, it uses semis or shuttles standard twins, singly between Iowa terminals and border staging areas. CF attempted in the past to use 60-foot combinations (consisting of a standard twin tractor, a standard twin trailer, and a shorter nonstandard trailer) for Iowa destinations and origins, "capturing" the short trailers at the first major terminal outside of Iowa, reshipping the freight and holding the short trailer for dispatch into Iowa. It found that practice infeasible and decided not to continue it, phasing it out as the equipment is retired. (A. 353-356)

[69] See, generally CF Ex. 32, Tr. 927 and 46, Tr. 1033.

55-foot semis. The arguments are insupportable.

B. Significance Of The Monetary Cost.

Monetary cost, standing by itself, is not normally a sufficient basis for invalidation of a state regulation, though it is a relevant factor, *Raymond v. Rice*, 434 U.S. 429, 445 n. 21 (1978). In their brief, Appellants have largely ignored the unquantifiable but very real burden on CF's operations and service. They focus instead on the dollar figure proven by CF to be the minimum cost. Even that figure is large,[70] and Appellants resort to misleading comparisons in an attempt to minimize it.

Appellants concede the minimum monetary cost of Iowa's ban to CF and its customers but assert that the cost is insignificant as it amounts to one-third of one percent of CF's total costs, Appellants' Br. 38. The artifice is in the basis of comparison. CF's total revenues are derived from operations in 48 states, many of which are minimally or not at all affected by Iowa's ban. Under Appellants' theory, to "properly" apportion the cost burden, the cost of Iowa's ban must be divided by the cost of shipments between Seattle and San Diego, between Chicago and Minneapolis, and other points on CF's system despite absence of any contact with Iowa.

As support for their comparison, Appellants cite this Court's calculation of the added cost to a barrel of oil imposed by Washington's escort tug requirement in *Ray v. Atlantic Richfield Co.*, 435 U.S. 151, 187 n. 9 (1978). *Ray* offers no such support. If Appellants' basis of comparison had been applied in *Ray*, the escort tug cost would have been spread over the cost per barrel of every voyage throughout the world.[71] See also 475 F. Supp. 544, 547 n. 2 (J.S. 18a).

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[70] Here, the quantified burden on CF, $2,004,113, is slightly less than the $2,050,081 estimated burden on CF of the Wisconsin ban. Appendix page 375, *Raymond v. Rice*, 76-558. The Wisconsin estimate was based on 1974 costs. Inflation and increased fuel costs have removed much of the cost difference referred to in the footnote quoted in Appellants' Brief at 39 to 40.

Because Iowa's ban has a gradually diffusing effect through many parts of the national system, it is difficult to precisely pinpoint the proper basis of comparison. Many of the economic effects are impossible to quantify, others are difficult to precisely identify. The most direct comparison is the simple cost of moving goods around rather than through Iowa. The diversion increases the mileage for that segment of the journey by 32%, increasing the direct vehicle operating costs by the same factor.[72] Because the ban necessitates additional reshipping and freight handling, the total increased cost is greater.

C. The Burden Is Not Voluntarily Incurred.

Appellants assert that the burden imposed by the Iowa ban is "voluntary." In a sense it is. Banned from using 65-foot twins through Iowa, CF is left with several "voluntary" alternatives: (1) operate semis; (2) operate 60-foot twins; (3) shuttle twins through Iowa; and (4) divert 65-foot twins around Iowa. As might be anticipated, CF uses a mixture of the alternatives which attempts to minimize the effects of Iowa's ban. (A. 354-356)

[illegible] assert that there would be no burden if CF merely chose to use 60-foot twins throughout the Midwest or Nation, Appellants' Br. 34. Appellants apparently overlook the fact that doing so would remove CF from the transportation system. Sixty-foot twins cannot be interchanged, do not meet any industry standard for general commodity equipment, and are not used anywhere in the country outside of Iowa other than to a slight extent in adjoining states for Iowa traffic.[73].

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[71] The major distinguishing factor between this case's burden and *Ray*'s is that in *Ray* no significant impediment was placed on interstate commerce other than the monetary cost. Here, Iowa's ban seriously impedes and disrupts interstate commerce, imposing significant non-monetary burdens.

[72] A. 604. On the same basis, using only direct vehicle operating costs, Iowa's DOT calculated the cost to all carriers, based on 1975 costs, to be $12,644,000 annually. (CF Ex. 2, p. 111, Tr. 107-108)

[73] A. 23, 155-157, 247, 276-277, 353, 354. CF interline and interchange is important. (A. 360-361; CF Ex. 32, p. 19, Tr. 927)

Appellants suggest that CF should use semis, citing Roadway Express, Inc., as an example. Although the largest general commodity carrier, Roadway has been an Eastern based regional carrier. Roadway has only recently become a transcontinental carrier. Roadway uses semis because of the legal restrictions in its principal operating area which prohibit twins. (Jones Depo. 3, 8-9, Ex. 1, Maps at pp. 4, 6; A. 375-377) Roadway would use twins if it could legally do so in its principal areas of operation. (A. 236-237) Unlike Roadway, the major transcontinental carriers of small shipments do not have their principal operations in Eastern areas which ban twins and make extensive use of twins. (A. 377; CF Ex. 32, pp. 21-22, Tr. 927)

Use of 55-foot semis or 60-foot twins throughout the general commodity system as a means of responding to Iowa's ban would result in a decrease in the efficiency of the entire system, an increase in shipping costs throughout the country, an increase in the number of vehicles needed to move the freight, and a corresponding increase in accidents throughout the country. (CF Ex. 46, pp. 30-35, Tr. 1033)

To suggest that CF and other carriers "voluntarily" incur the burden of Iowa's ban by not changing the national system to comport with Iowa's requirements is understandable only from a very parochial viewpoint. Ironically, were the general commodity motor carrier industry able to adopt Appellants' suggestion, such vehicles would operate over then unimpeded shorter routes via Interstate highways in Iowa, eliminating the local benefit from reduced traffic.

D. The Safety Burden On Interstate Commerce.

The most significant effect of Iowa's ban is to divert twin traffic around the state. The result is a decrease in accidents in Iowa and an increase in accidents in the neighboring states of Illinois, Missouri, and Nebraska. The total increase in accidents exceeds the decrease in Iowa. The increase is attributable to the increased mileage and the fact that diverted traffic travels on roads that are predominantly two-lane and substantially less safe than the Interstate routes through Iowa.[74]

As stated by the District Court in denying Appellants' Motion for Stay Pending Appeal:

> ". . . under the circumstances the granting of the stay would result in more accidents, more injuries, more fatalities and more fuel consumption, than would occur if the 65 foot twins were operated through Iowa over I-80 and I-35." (A. 579)

The safety burden exists regardless of the measures CF takes to cope with the ban.

CONCLUSION

Iowa's ban of 65-foot twins does not serve any legitimate local public interest. It does not promote safety except in the parochial sense of promoting safety in Iowa by shifting interstate commerce to sister states. It unnecessarily burdens interstate commerce.

The decisions below should be affirmed.

Respectfully submitted,

JOHN H. LEDERER

DeWITT, SUNDBY, HUGGETT
& SCHUMACHER, S.C.
121 South Pinckney Street
Madison, Wisconsin 53703
(608) 255-8891

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[74] See footnotes 28 and 45 above.

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In The

Supreme Court of the United States

October Term, 1979

Raymond Kassel, *et al.*,
Appellants,
v.
Consolidated Freightways Corporation of Delaware,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

REPLY BRIEF FOR APPELLANTS

Thomas J. Miller
Attorney General of Iowa

Mark E. Schantz
Solicitor General
Hoover State Office Building
Des Moines, Iowa 50312
(515) 281-5191

Robert W. Goodwin
Special Assistant Attorney General

Lester A. Paff
Assistant Attorney General

Attorneys for Appellants

Wilson - Epes Printing Co., Inc. - 789-0096 - Washington, D.C. 20001

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Miscellaneous:

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IN THE
Supreme Court of the United States
OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, *et al.*,
Appellants,
v.
CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation,
Appellee.

On Appeal from the United States Court of Appeals for the Eighth Circuit

REPLY BRIEF FOR APPELLANTS

ARGUMENT

I. RESTATEMENT OF THE CASE.

Once upon a time, the trucking world was dark. Shippers could send their goods to other states only by rail or in unsafe and expensive 55-foot semis and 60-foot twin trailers. Then, out of the West, came the greatest technological breakthrough since the internal combustion engine—the 65-foot twin trailer. It was adopted universally. Shipping rates declined. Accidents nearly disappeared. Owners of Volkswagen "Bugs" formed a "65-foot Twin Fan Club."

This blissful state of nature persisted for many years. Life was good. Then, from the primitive swamp between the Mississippi and Missouri Rivers, emerged a dark figure, controlled by those enemies of progress, the American Automobile Association and the Des Moines Register. With one brutal blast of his black pen, Governor Robert Ray "banned" the "industry standard" and plunged the "national transportation system"[1] into chaos from which it can emerge only if the living Commerce Clause devours state length limitations.

Iowa does not borrow from the Brothers Grimm merely to lighten this mirthless litigation. Rather, we deliberately exaggerate CF's claims in an effort to illustrate that the use of imprecise, emotion-laden terminology can warp perspective. Resort to the record will restore perspective on two background questions. Does Iowa "ban" 65-foot twins? In what relevant sense, if any, is the 65-foot twin the "industry standard" or otherwise essential to the "national transportation system?"

The movement toward larger vehicles accelerated after World War II. (A. 93-94). The twin-trailer configuration appeared in significant numbers in the early 1950's. In California, for example, twin trailers have been permitted since 1950. From 1950 to 1959, 60-foot twins were the longest allowed in California; 65-foot twins have been permitted since 1959. (A. 49).

The American Association of State Highway and Transportation Officials (AASHTO) has recommended regulatory standards on a variety of matters, including vehicle length, for many years. From 1946 until 1963, the AASHTO recommended limit for twins was 60 feet; since 1963 the recommendation has been 65 feet.[2] Most western and midwestern states have increased the length limit for twins to 65 feet: Kansas and Nebraska in 1965 (A. 65, 82), Illinois in 1967 (designated routes) (A. 62), and Minnesota in 1973 (A. 58). To the present time, at least 18 states have declined to modify their regulations to permit the operation of 65-foot vehicles on their highways. (A. 645).

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[1] See, *e.g.*, Appellee's Brief at 21.

[2] Three charts entitled "Legal Maximum Dimensions and Weights of Motor Vehicles Compared With AASHTO Standards," which

Iowa authorized the operation of 60-foot twin trailers in 1963, after having previously increased the limit three times since 1945.[3] In 1974, the Iowa General Assembly sent to Governor Robert Ray a bill increasing the length limit for twins to 65 feet. The Governor vetoed the bill. (A. 420). Later in the session the Governor signed a bill permitting cities adjacent to other states, at their option, to borrow the length limit prevalent in the adjoining state. (A. 422). To summarize, Iowa has never left vehicle length unregulated; nor has it authorized 65-foot twins. Thus, it has never been necessary affirmatively to outlaw ("ban") the vehicles CF prefers to operate.

Iowa does not dispute that those general commodity carriers which have extensive operations in states which permit 65-foot twins have invested heavily in 27 or 28-foot boxes rather than the 24-foot boxes that were employed with the 60-foot twins. But it is not true that there is some particular box with unique physical properties which all carriers do or must acquire; purchasing a trailer box is not like purchasing a Mercedes 450 SL. Manufacturers will provide boxes in any length ordered

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reveal the evolution of its policy concerning the length of twins, are set forth as an Appendix to this Reply Brief. These charts are earlier versions of Exhibit 511, which appears at A. 645.

[3] The history of § 321.457 is summarized in 15A Iowa Code Ann. 249 (West 1966).

(A. 92) and CF orders its trailers built to its own specifications (A. 344-45).

Indeed, trailer boxes in the 26 to 28-foot range have never commanded a dominant share of the total market for trailing equipment.[4] CF did not provide comprehensive data establishing the percentage of general commodities transported on 65-foot twins. CF itself carried a substantially greater percentage of its freight in semis in 1977 than it did in 1974, primarily because it has expanded its operation into an area where 65-foot twins are not authorized. (A. 349).

The record provides no technological basis for any suggestion that a 65-foot twin is superior to a 60-foot twin scaled down to otherwise identical specifications. All of the supposed advantages of twins over semis (Appellee's Brief at 1-2) are present with 60-foot twins. (A. 239). A 60-foot twin is to a 65-foot twin as a long truck is to a longer truck. Period.

CF's own witnesses make clear that the principal determinants of the length and configuration of equipment operated by general commodity carriers are state laws and the region(s) of the country where a carrier has its largest operation. (A. 92, 240, 364-65). This is conceded with respect to Roadway Express, Inc. (Appellee's Brief at 48). There is no national standard in any *technological* sense. And, because there is nothing like national uniformity in length *regulation*, it cannot fairly be said that Iowa is out of step with *any* national standard.

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[4] Calvin Dep. at 27-42; Calvin Dep. Ex. #5. This exhibit is dated September, 1976 and is a mailing from the Truck Trailer Manufacturer's Association to its members setting forth the results of a recent survey on van trailer production. The sample suggested the following percentages of trailers in the 26 to 28-foot range were produced in each of the following years: 1946-23.5%; 1956-1.1%; 1966-15.4%; 1976-8.6%.

A fair and accurate perspective on these matters generates questions about CF's position on the issues. Was Iowa's 60-foot limitation unconstitutional at its enactment in 1963? If so, would it not be only because all length limitations everywhere are unconstitutional, a contention CF purports to disavow? (Appellee's Brief at 20). If, on the other hand, it has somehow become unconstitutional since 1963, what has caused this profound change? Was it the change in the AASHTO standards? Was it the action in that time of 15 or 20 states to increase their length limit to 65 feet? Was it Governor Ray's veto of a bill that would have increased Iowa's limit? Was it the enactment of the so-called "border cities exception?" Was it the 1975 Iowa DOT Study? Was it increased research by the Western Highway Institute into the comparative safety of twin trailers and semitrailers? Was it the increased use of Interstate 80 for transporting freight? Certainly these factors are not of a type that have previously been given weight in Commerce Clause jurisprudence. Iowa submits that the proper focus is upon whether the length limitation for twin trailers adopted by the Iowa legislature in 1963 is inherently burdensome to interstate commerce.

With a fair and accurate perspective on the factual and legal background, it is apparent that the only advantage of a 65-foot twin over the vehicles authorized for use on Iowa's highways is the greater volume of freight which the longer trailers will accommodate. (A. 119-20).[5] Small increases in efficiency are not unimportant, but CF does not dispute that if Iowa's length limitation may be fairly characterized as a safety regulation, it should survive the Commerce Clause balancing test. (Appellee's Brief at 5, 16). Iowa respectfully submits, therefore, that this Court should direct its primary attention to the question whether CF has demonstrated that Iowa's length limitation is unrelated to safety. If so, CF should prevail; if not, Iowa should prevail.

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[5] The theoretical increase in volume is approximately 10 per cent, but CF did not demonstrate that it could fully utilize the increased volume. (Meyers Dep. at 37-39).

II. IOWA'S LIMITATIONS ON TRUCK LENGTH ARE SAFETY REGULATIONS.

Iowa's position on this central issue is set out at length in Appellant's Brief at 11-30 and need not be fully repeated here. Rather, Iowa would respond to the three contentions we understand CF now to make: 1) all length limitations are negatively correlated with safety because they require carriers to travel more miles, 2) Iowa's length limitation is negatively correlated with safety because it "diverts" traffic around Iowa, and 3) a length limitation is valid if, but only if, a state can demonstrate that all vehicle types which may operate on its highways are "safer" than all vehicles which are excluded by the regulation.

A. At several points in its brief, CF appears to contend that longer trucks are necessarily safer trucks. Asserting that *Southern Pacific Co.* v. *Arizona*, 325 U.S. 761 (1945), rests upon the simple syllogism that "shorter trains meant more trains, and more trains, more accidents," CF proceeds to argue: "This case is like *Southern Pacific.* If 65-foot twins are safe vehicles, Iowa's ban increases the number of accidents associated with interstate traffic by increasing vehicle miles." (Appellee's Brief at 6, 13-15).

If this is truly their position, it has far reaching implications and is plainly inconsistent with CF's disclaimer: "CF does not contend that length limits never promote safety, nor does it contend that Iowa does not possess the power to impose length limits." (Appellee's Brief at 20). If longer trucks are necessarily safer trucks, then all length limits are perversely irrational.

Legislatures should be *requiring* rather than *prohibiting* the use of 85-foot vehicles. And, length limitations could not survive due process scrutiny, much less the Commerce Clause balancing test.

If this is CF's position, it rests upon the fallacy of single-variable analysis: *all other things being equal,* longer trucks mean fewer trucks, fewer trucks mean fewer miles and fewer miles mean fewer accidents. The "all other things being equal" constraint requires the assumption that length is not related to safety in any other respect than reducing the number of trucks required by some, possibly de minimus, amount. That assumption is precisely the point in issue herein and CF neither pleaded nor proved that length bears no other relationship to safety.

Logically, CF's argument is identical in form to a claim that speed limits are necessarily negatively related to safety. All other things being equal, it is doubtless true that the longer time spent on the highway, the greater risk of involvement in an accident. A person who drives across Iowa at 80 miles per hour can do so in about 4 hours; a person travelling 60 miles per hour requires at least 5 hours. By analogy to CF's theory, the person travelling 60 miles per hour encounters a 25 per cent greater likelihood of an accident. Most people reject that conclusion because, believing that speed is related to safety other than merely with respect to time on the highway, they know one should not assume all other things are equal.

After relying primarily on *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978), throughout these proceedings, CF is now sharply critical of certain propositions in *Raymond* which it finds contrary to its theory (Appellee's Brief at 5, 11, 18, 41) and apparently disposed to shift its reliance to *Southern Pacific.* Iowa would contend that *Southern Pacific* is not suited to highway use.

As previously noted, the issue of legislative fact in *Southern Pacific* was whether the length of trains was generally related to their safety; the ultimate issue was whether train length should be totally unregulated by the states. CF did not plead and has not proved that truck length is unrelated to safety; CF continues to deny that a decision affirming the court below would terminate all state regulation of vehicle length. (Appellee's Brief at 20).

Moreover, this Court in *Southern Pacific* did not rely on the "all other things being equal" formula now advanced by CF to conclude that limiting the length of trains, viewed in terms of its "total effect as a safety measure," was ineffective. In addition to other evidence, this Court relied heavily on a direct comparison of the accident experience in Nevada, which did not regulate train length, with Arizona, which did. Nevada had significantly fewer accidents. 321 U.S. at 778. CF tendered no comparable proof, no evidence even suggesting that accident rates are lower in Wyoming, with its 85-foot limit, than in Georgia, with its 55-foot limit. Nor did CF tender an expert who was willing to state that total safety will improve if length is unregulated.

Even were CF's attempted analogy to *Southern Pacific* otherwise apposite, CF ignores key factual and legal distinctions between trucking and railroading. A key difference in safety terms is that only trains run on railroad tracks. Trucks must share, albeit reluctantly at times, use of the highways with small cars. Any safety problems involving long trains would reveal themselves in accidents involving trains. But long trucks may cause accidents in which the truck is not physically involved and which, therefore, are not reported as truck accidents. When CF attempts to focus exclusively on whether the

65-foot twin is "a safe vehicle," (Appellee's Brief at 6), it appears to ignore these safety concerns for other highway users.

Finally, this Court has consistently treated state regulation of railroads differently from state regulation of highways with respect to burdens on interstate commerce. The point was made emphatically in *Southern Pacific*, 325 U.S. at 783, and reaffirmed in *Raymond*, 434 U.S. at 444, n. 18. CF complains that the Court's distinction between "local" and "national" subjects of commerce is insufficiently explanatory (Appellant's Brief at 14). Perhaps so, but Congress has been aware that a distinction between highways and railroads has prevailed with this Court for 60 years and has not been moved to intervene.

B. If CF's contention is not that all length limitations increase the risk of accidents, then their contention collapses into the more concrete, but also flawed, claim that any state limitation which "diverts" interstate traffic increases the risk of accidents. This is simply a new variation on their "burden analysis" and necessarily involves double-counting. CF would have this Court attribute to the State of Iowa both the economic costs alleged to stem from the "diversion" and the theoretical increase in accidents predicted from travelling the longer routes around Iowa. But, as we have previously argued, CF could transport freight through Iowa in 55-foot semis or in 60-foot twins, vehicles which are or have been in CF's fleet. CF now seldom does that because they have determined that it costs less to route their 65-foot twins around Iowa. Having made this election for economic reasons and having disregarded the alleged safety factor in reaching the decision, CF cannot then attribute to Iowa's length limitation the "safety burden on national interests." Put differently, CF cannot choose a longer route for economic reasons, ignore the safety factor, and then claim that Iowa's length limitation causes *both* an economic and a safety burden on interstate carriers.[6]

C. CF expends much energy on appeal, as it did at trial, in support of the proposition that 65-foot twins, which Iowa does not allow on its highways, are as safe as 55-foot semis, which are allowed. Perhaps our prior statement was unclear, but Iowa concedes that the available evidence does not indicate any gross differences in safety based upon *configuration* between doubles and semis. (Appellant's Brief at 28). Indeed, Iowa would not ask this Court to review such a comparatively narrow question of adjudicative fact. Rather Iowa contends that the proper issue is whether length is generally related to safety as a matter of legislative fact. It is just this misformulation of the issue in the courts below which is the basis for this appeal.

In this respect, Iowa has argued that to permit such a misleadingly specific attack on length limitations is to condone the "salami tactics" by which all length limitations would be eliminated, five short feet at a time. CF's response is to suggest that, were it to challenge the 65-foot length limitation prevailing in a number of states, it would be doomed to failure because a sufficient burden on interstate commerce could not be established. (Appellee's Brief at 21). This suggestion speaks volumes concerning the nature of CF's burden argument in this case, i.e., it is totally dependent upon first persuading some unspecified number of legislatures to increase their limit and then selecting equipment the maximum length permitted by law. As previously noted, CF could not establish a comparable burden in Georgia, which also "bans" 65-foot twins, because the vehicle is not the "industry standard" there. Were there anything of substance to CF's burden claim, it would endanger a 65-foot limit, an 85-foot limit and any other limit in every state. For all that appears, however, CF's burden claim is essentially a play on words and should endanger other limitations no more than it threatens Iowa's.

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[6] Iowa contends that it is inappropriate to attribute *either* burden to its length limitation. See Brief for Appellants at 35-37. The diversion of equipment around Iowa stems from CF's voluntary business decisions and legislative changes by Iowa's neighbors.

CF's response to Iowa's example of salami tactics drawn from the width limitation context is also revealing. CF purports to concede that a challenge to an eight-foot width limitation by a carrier with an eight-foot, three-inch long vehicle would fail because eight feet is the "standard" width. (Appellee's Brief at 21). How many states would have to increase the limit to eight feet, three inches and how much wider equipment must be purchased before the limitation becomes vulnerable? CF's theory is faulty because it rests not upon any objective, external standard to which Iowa should conform, but rather upon an indeterminate reference, subject to change at any time by the legislatures of a few other states and CF's voluntary business decisions. Citizens of Iowa should be subject to rules formulated by a majority in Congress or by the Iowa General Assembly; they should not be subject to length limitations fashioned by a majority of the Illinois and Nebraska Legislatures and a majority of CF's board of directors.

CF also responds to Iowa's width limitation example by asserting that an impermissible burden on interstate commerce would be created were Iowa to *reduce* the width limitation to seven feet, nine inches. Without stating flatly that such a change in regulation would be unconstitutional, Iowa certainly would concede that a *reduction* in the limit is a different case and that heightened judicial scrutiny would be warranted for two reasons. First, if carriers have selected equipment in *reliance* on a particular width limit, changing to a more stringent regulation begins to resemble a "taking" of property without due process of law. Second, a state which has operated with a liberal dimension limit perhaps should be expected to justify by "newly discovered evidence" its reasons for adopting a stricter limitation.

But that is not this case. Iowa has not reduced its length limit. CF could not have relied upon an implied representation that longer vehicles would be permitted in Iowa. That is why Iowa objects to CF's use of the term "ban"—a term which may misleadingly connote that Iowa took affirmative steps to outlaw 65-foot twins. And, *inter alia,* that is why *Bibb* v. *Navajo Freight Lines, Inc.,* 359 U.S. 520, 525 (1959) is inapposite here. In *Bibb,* Illinois affirmatively required a novel type of mudflap when it had previously *required* a type legal in nearly all other states.[7] Here, CF is asking the federal courts to repeal a length limitation statute on the theory that the Iowa legislature's *inaction* is constitutionally unacceptable.

III. THE BORDER CITY PROVISION IS NOT DISCRIMINATORY AND DOES NOT TRIVIALIZE IOWA'S CONCERN FOR SAFETY.

CF argues that the "exception" to Iowa's 60-foot limitation for border cities who choose to borrow the limit of an adjacent state constitutes discrimination against interstate commerce. In most respects, this argument seems beside the point. One would suppose that the remedy for a "discriminatory" exception would be to hold the exception invalid and require Iowa to apply its limitation uniformly.[8] CF does not seek that remedy and has neither alleged nor proved facts which would give it standing to raise the claim. Nonetheless, Iowa will reply briefly to CF's attack on the border cities provision because of the suggestion that the very existence of the provision renders "trivial" the safety justification for the general limitation. (Appellee's Brief at 42).

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[7] *Bibb* is also distinguishable because the Illinois requirements *conflicted* with those in other states; carriers were required to change equipment. Here, the 60-foot twins lawful in Iowa may be operated wherever CF may operate 65-foot twins.

[8] Tushnet, *Rethinking the Dormant Commerce Clause,* 1979 Wis.L.Rev. 125, 159.

Iowa explained in its opening brief that the District Court had found the border city provision nondiscriminatory, that CF produced no evidence that this provision eliminates local *hardships* created by the 60-foot limitation, and that intuitively the provision seemed equally to accommodate out-of-state carriers and shippers who generally employ overlength vehicles.[9] Of course, Iowa shippers in certain border cities may have their commodities shipped in 65-foot twins, at the discretion of the carrier, and at the same rate as they would be carried on 60-foot twins.

CF responds with outrage to this analysis, claiming "the record shows that economic benefit to Iowa shippers was the impetus for the border city exemption." (Appellee's Brief at 42). In support of that statement, CF cites a passage from Governor Ray's veto message concerning a bill which would have permitted 65-foot twins on all highways in Iowa and then notes that the legislature passed the border city provision shortly thereafter. We are not advised how one may infer the *legislature's* reasons for *adopting* a provision which might result in limited use of 65-foot vehicles from the Governor's reasons for *vetoing* a bill broadly *authorizing* longer trucks. With all due respect, the suggested inference is a complete non sequitur.

CF then notes that laws which achieve advantages for one state's interstate commerce over the interstate commerce of other states offend the Commerce Clause. Iowa agrees. But it is not self-evident, and CF does not prove, that the border city provision has this effect. There is no a priori reason to believe Iowa firms in border cities ship more commodities to out-of-state destinations in 65-foot vehicles than enter Iowa border city markets on 65-foot vehicles. Internal cities like Des Moines, Cedar Rapids and Waterloo may neither export nor import commodities on 65-foot vehicles. Thus, CF's attempted analogy with Wisconsin's interplant permit exemption in *Raymond*, 434 U.S. at 446 n. 24, does not fit. That exemption did not give out-of-state firms access to Wisconsin markets on an equivalent basis.

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[9] The background of the border city provision is discussed by Dennis Ehlert, Director of Motor Vehicle Enforcement, Iowa DOT. (A. 414-17).

Finally, CF's broad contention that any deviation from a uniform length limitation trivilizes the safety concern will not withstand analysis. For example, this past summer, Iowa issued a permit allowing an indivisible 139-foot, 170-ton accelerator to be transported from Argonne Laboratories in Illinois to Stanford University via Interstate 80. Detailed conditions specified the particulars of the journey. Iowa recognized the lack of alternatives (necessity) and required the trip to be as safe as reasonably possible. Doubtless it posed a greater hazard than an unrestricted single trip with a 65-foot twin. Yet there is no inconsistency here. It is not inconsistent to respond differently to different situations.

IV. THE LEGISLATIVE BRANCH IS COMPETENT TO DECIDE POLICY QUESTIONS INVOLVING THE BALANCING OF SAFETY AND EFFICIENCY.

CF makes a curious attack on the lawmaking capability of the legislative branch of government: "a legislature is a poorly constituted body to make a factual judgment as to whether or not a regulation promotes safety." (Appellee's Brief at 12). Is it unfair to ask whether this remark applies to those legislatures the industry has persuaded to increase the length limitation to 65 feet or whether it is confined to the Iowa legislature? In any event, the point of the remark is apparently to suggest that the federal courts are better suited for this type of work.

Iowa has no quarrel with a court affording CF an opportunity to prove that the stated justification for a statute, in this case safety, is not the real reason, i.e., to prove that length is unrelated to safety. As demonstrated above, this CF has not done. But Iowa does submit that it was inappropriate for the courts below to accept CF's invitation to second-guess the legislature in drawing a particular line. Line-drawing does not involve safety alone; line-drawing, in this context and others, necessarily involves the weighing of competing interests and the making of judgments on incomplete information. Put differently, line-drawing involves questions of policy, not pure questions of fact. Perhaps the point can be clarified in this way: if safety were the only variable to be considered in establishing a length limitation, one would expect trucks to be the same length as cars. (Crawford Dep. at 9). It is only by weighing economic factors along with safety that the Iowa legislature has decided to permit trucks of a length it does. This Court has consistently indicated that federal courts should not second-guess legislative weighing of interests, at least unless the burden on interstate commerce overwhelms a marginal concern for safety. *Brotherhood of Locomotive Firemen and Enginemen* v. *Chicago, R.I. & P.R.R. Co.*, 393 U.S. 129, 138-39 (1968).

Iowa has previously argued that the *Brotherhood* principle is sufficiently protective of national economic interests because Congress may assert its primary authority over interstate commerce should it determine that a state legislature regulates too stringently. Iowa also noted that the available evidence indicates Congress believes that the permissible size and weight of trucks are questions for state legislatures. CF responds: "Had Congress believed *Raymond* not to express its intent, it could have passed legislation overruling that case." (Appellee's Brief at 25). Why would Congress bother to overrule a decision that the industry maintained and this Court stated applied only to statutes and facts peculiar to Wisconsin? Indeed, CF's suggestion is belied by the strenuous recent efforts of the ATA to obtain federal legislation preempting state length limitations less than 65 feet, efforts that would be unnecessary were it apparent to all that *Raymond* had required all states to allow 65-foot twins.

CONCLUSION

For the foregoing reasons, as well as for the reasons set forth in our opening brief, the judgment of the Court of Appeals should be reversed.

Respectfully submitted,

THOMAS J. MILLER
Attorney General of Iowa

MARK E. SCHANTZ
Solicitor General
Department of Justice
2nd Floor, Hoover Building
Des Moines, Iowa 50312
(515) 281-5191

ROBERT W. GOODWIN
Special Assistant Attorney General
Department of Transportation
Ames, Iowa 50010
(515) 296-1521

LESTER A. PAFF
Assistant Attorney General
Department of Transportation
Ames, Iowa 50010
(515) 296-1636

Attorneys for Appellants

APPENDIX

STATE LEGAL MAXIMUM LIMITS OF MOTOR VEHICLE SIZES AND WEIGHTS COMPARED WITH AASHO STANDARDS

Prepared by the Bureau of Public Roads, December 31, 1962.

Line	State	Width inches[1]	Height ft.-in	Length-feet[2]				Numbered of towed units[3]			Axle load-pounds				Gross weight limit			Specified maximum gross weight-pounds[4]						Practical maximum gross weight—pounds[5]						Line
				Single unit		Truck tractor semi-trailer	Other combination	Semi-trailer	Full trailer	Semi-trailer and full trailer	Single		Tandem		Type of restriction	Applicable to:		Truck		Truck-tractor semitrailer			Other combination	Truck		Truck-tractor semitrailer			Other combination	
				Truck	Bus						Statutory limit	Including statutory enforcement tolerance	Statutory limit	Including statutory enforcement tolerance		Any group of axles	Total wheel base only	2-axle	3-axle	3-axle	4-axle	5-axle		2-axle	3-axle	3-axle	4-axle	5-axle		
1	Alabama	96	13-6	35	40	50	NP	1	NP	NP	18,000	19,800	36,000	39,600	Table		X							27,800	47,600	47,600	60,010	64,650	NP	1
2	Alaska	96	12-6	35	[19]40	60	60	1	1	2	18,000		32,000		Table-tire cap.	Under 18'	Over 18'	36,000	50,000	50,000	72,000	76,800	76,800	26,000	40,000	44,000	58,000	72,000	76,800	2
3	Arizona	96	13-6	40	40	65	65	1	1	2	18,000		32,000		Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,800	3
4	Arkansas	96	13-6	35	40	50	50	1	1	NP	18,000	[7]18,500	32,000	32,500	Spec. maximum[8]									26,500	40,500	45,000	59,000	65,000	65,000	4
5	California	96	13-6	35	[9]35	60	65	NR	NR	NR	18,000		32,000		Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,000	5
6	Colorado	[11]96	[12]13-6	35	40	60	[10]60	1	2	2	18,000		36,000		Formula-spec. limits		X	30,000	46,000					26,000	44,000	44,000	62,000	76,000	76,000	6
7	Connecticut	102	12-6	50	50	50	NP	1	NP	NP	22,400	22,848	36,000	36,720	Spec. lim.-tire cap.			32,000	50,000	50,000	60,000	60,000	NP	30,848	44,720	51,000	61,200	61,200	NP	7
8	Delaware	96	13-6	40	42	55	60	1	1	NP	20,000		36,000		Table-spec. limits[13]	X		30,000	46,000	48,000				28,000	44,000	48,000	64,000	73,280	73,280	8
9	District of Columbia	96	12-6	40	40	50	50	1	1	NP	[46]22,000		38,000		Table	X					70,000	70,000	70,000	30,000	46,000	52,000	[54]68,000	[54]70,000	[54]70,000	9
10	Florida	96	13-6	[14]35	40	55	55	1	1	NP	20,000	22,000	40,000	44,000	Table		X							30,000	52,000	52,000	65,200	73,095	73,095	10
11	Georgia	96	13-6	[15]39	[15]45	50	50	1	1	NP	18,000	20,340	36,000	40,680	Spec. maximum[16]								63,280	28,340	48,680	48,680	63,280	63,280	63,280	11
12	Hawaii	108	13-0	40	40	55	65	1	1	2	24,000		32,000		Formula[17]	X								32,000	38,800	56,000	64,000	72,000	80,000	12
13	Idaho	[11]96	14-0	35	[19]40	60	65	1	1	2	[20]18,000		[20]32,000		Table[20]	X								26,000	40,000	44,000	58,000	73,280	76,800	13
14	Illinois	96	13-6	42	42	[25]55	60	1	1	2	[21]18,000		32,000		Spec. lim.-tire cap.			36,000	[22]41,000	45,000	59,000	72,000	72,000	26,000	40,000	44,000	58,000	72,000	72,000	14
15	Indiana	[11]96	13-6	36	40	50	[25]50	1	1	2	[23]18,000	[23]19,000	[23]32,000	[23]33,000	Spec. lim.-tire cap.								72,000	27,000	41,000	45,000	59,000	[23]73,000	[23]73,000	15
16	Iowa	96	13-6	35	[19]40	50	50	1	[24]1	3	18,000	18,540	32,000	32,960	Table	X								26,540	40,960	45,080	59,500	73,280	73,280	16
17	Kansas	96	13-6	35	[19]40	50	50	1	1	NP	18,000		32,000		Table	X								26,000	40,000	44,000	55,470	73,280	73,280	17
18	Kentucky	96	[12]13-6	[26]35	[26]35	[27]50	[27]50	1	NP	NP	18,000	[28]18,900	32,000	[28]33,600	Spec. lim.-tire cap.[29]			27,000	42,000	42,000	59,640	73,280	NP	27,000	42,000	42,000	59,640	73,280	73,280	18
19	Louisiana	96	13-6	35	[19]40	55	60	1	1	NP	18,000		32,000		Axle lim.-tire cap.									26,000	40,000	44,000	58,000	72,000	76,000	19
20	Maine	96	[30]12-6	55	55	55	55	1	1	NP	[30]22,000		[30]32,000		Table-tire cap.	X		32,000	[30]51,800	51,800	60,050	70,550	70,550	30,000	40,000	51,800	62,040	70,550	70,550	20
21	Maryland	[18]96	[6]12-6	55	55	55	[40]55	NR	NR	NR	22,400		[31]40,000		Formula		X			65,000	65,000	65,000	65,000	30,400	48,000	52,800	65,000	65,000	65,000	21
22	Massachusetts	96	NR	35	[19]40	50	NP	1	NP	NP	22,400		36,000		Table-spec. limits			[32]46,000	[32]60,000	[32]60,000	[32]73,000	[32]73,000	NP	30,400	44,000	52,800	66,400	73,000	NP	22
23	Michigan	96	13-6	35	40	55	55	1	1	2	[33]18,000		[34]32,000		Axle lim.-tire cap.									26,000	[35]44,000	44,000	[35]66,400	[35]73,000	NP	23
24	Minnesota	96	13-6	40	40	50	50	1	1	NP	18,000		32,000		Table	X						[36]73,280		26,000	[35]40,000	44,000	[35]58,000	[35]66,000	[35]102,000	24
25	Mississippi	96	13-6	35	40	55	55	1	1	NP	18,000		28,650	[35]32,000	Table-tire cap.	X								26,000	[35]40,000	44,000	59,000	[35]64,650	[35]64,650	25
26	Missouri	96	12-6	35	40	50	50	1	1	2	18,000		32,000		Table	X								26,000	40,000	44,000	55,470	64,650	64,650	26
27	Montana	[11]96	13-6	35	40	60	60	1	1	[37]2	18,000		32,000		Table	Under 18'	Under 18'							26,000	40,000	44,000	58,000	72,000	76,000	27
28	Nebraska	96	13-6	40	40	60	60	1	1	2	18,000	18,900	32,000	33,600	Table	X		36,000	54,000	54,000	71,146	71,146	71,146	26,780	41,200	45,320	59,740	73,280	73,280	28
29	Nevada	96	NR	NR	NR	NR	NR	NR	NR	NR	18,000	18,900	32,000	33,600	Table	Under 18'	Under 18'							26,900	41,600	45,800	60,500	75,200	76,800	29
30	New Hampshire	96	13-6	35	[35]40	50	50	NR	NR	NR	22,400		36,000		Tables-spec. limits		X	33,400	[38]47,500	52,800	66,400			30,400	44,000	52,800	66,400	66,400	66,400	30
31	New Jersey	[44]96	[44]13-6	35	[39]35	50	[40]50	1	1	NP	22,400	23,520	32,000	33,600	Spec. limits			30,000	40,000	60,000	60,000	60,000	60,000	31,500	41,600	55,040	63,000	63,000	63,000	31
32	New Mexico	[41]96	13-6	40	40	65	65	1	1	2	21,600		34,320		Table	Under 18'	Over 18'							29,600	42,320	51,200	63,920	76,640	86,400	32
33	New York	96	[6]13-0	35	[42]35	50	50	1	1	NP	22,400		36,000		Formula		X					65,000	65,000	30,400	44,000	52,800	65,000	65,000	65,000	33
34	North Carolina	96	[6]12-6	35	[19]40	[43]50	[43]55	1	1	NP	18,000	19,000	36,000	38,000	Spec. limits			31,500	46,200	46,200	65,100	65,100	65,100	27,000	46,000	46,000	65,100	65,100	65,100	34
35	North Dakota	[44]96	[44]13-6	[14]35	[19]40	60	60	1	1	2	18,000		32,000		Formula	Under 18'	Over 18'							26,000	40,000	44,000	60,000	[44]64,000	[44]64,000	35
36	Ohio	96	13-6	35	[19]40	50	60	1	NR	NR	19,000		31,500		Formula		X							27,000	39,500	46,000	58,500	71,000	78,000	36
37	Oklahoma	96	13-6	35	45	[45]60	[45]60	1	1	NP	18,000		32,000		Table	X								26,000	40,000	44,000	58,000	72,000	73,280	37
38	Oregon	96	[12]13-6	35	[35]40	[25,35]55	[35]65	1	1	[35]2	[47]18,000		[47]32,000		Table[48]	Under 18	Over 18'					[48]76,000	[48]76,000	26,000	40,000	44,000	58,000	72,000	[48]76,000	38
39	Pennsylvania	96	[6]12-6	35	40	[56]50	[40]50	1	1	NP	22,400	23,072	36,000	37,080	Spec. limits[49]			33,000	47,000	50,000	60,000	60,000	62,000	31,072	45,080	51,500	61,800	61,800	63,[illegible]50	39
40	Puerto Rico	96	12-6	35	40	50	50	1	1	NP	NS		NS		Spec. lim.-tire cap.[63]															40
41	Rhode Island	102	12-6	40	40	50	50	1	1	NP	22,400		NS		Spec. limits			[50]36,000	[51]44,000	[52]50,000	[13]60,000	60,000	88,000	30,400	44,000	50,000	60,000	60,000	88,000	41
42	South Carolina	96	13-6	[14]35	[19]40	55	[59]60	1	1	NP	20,000		32,000		Table	X								28,000	40,000	48,000	60,000	66,839	71,115	42
43	South Dakota	96	13-6	35	40	60	60	1	1	2	18,000		32,000		Table	X								26,000	40,000	44,000	58,000	72,000	73,280	43
44	Tennessee	96	[6]12-6	35	40	50	50	1	[53]1	NP	18,000		32,000		Table		X							26,000	40,000	44,000	58,000	61,580	43,500	44
45	Texas	96	13-6	35	40	50	50	1	1	NP	18,000	18,900	32,000	33,600	Table	X								26,900	41,600	45,800	60,500	75,200	75,600	45
46	Utah	96	14-0	45	45	60	60	NR	NR	NR	18,000		[64]33,000		Table[65]	X								36,000	51,000	54,000	69,000	79,900	79,900	46
47	Vermont	96	12-6	50	50	50	50	1	1	NP	NS		NS		Spec. lim.-tire cap.			[55a]32,000	[55b]55,000	[55c]52,800	[55d]66,400	[55d]66,400	[55d]66,400	[55a]32,000	[55b]55,000	[55c]52,800	[55d]66,400	[55d]66,400	[55d]66,400	47
48	Virginia	96	13-6	35	40	50	50	1	1	NP	18,000		[57]32,000		Table	X						70,000	70,000	26,000	40,000	44,000	60,000	70,000	70,000	48
49	Washington	96	13-6	35	[19]40	60	[58]65	1	1	[58]2	18,000		32,000		Table	Under 18'	Over 18'	28,000	36,000	46,000	60,000	68,000	72,000	26,000	36,000	44,000	60,000	68,000	72,000	49
50	West Virginia	96	[6]12-6	35	[19]40	50	50	1	1	NP	18,000	18,900	32,000	33,600	Table	X					[66]70,000	[66]70,000	[66]70,000	26,900	41,600	45,800	57,844	63,840	63,840	50
51	Wisconsin	96	13-6	35	40	50	[67]50	1	1	NP	18,000	[60]19,500	30,400	32,000	Table[61]	X								27,500	40,000	47,000	59,500	73,000	73,000	51
52	Wyoming	96	13-6	40	40	65	65	1	1	2	18,000		32,000	[62]36,000	Table	X								26,000	44,000	44,000	62,000	73,950	73,950	52
	AASHO Policy	96	12-6	35	[19]40	50	60	1	1	NP	18,000		32,000		Table	X								26,000	40,000	44,000	55,470	61,490	71,900	
	Number of States: Higher Same Lower	3 49 0	45 7 0	18 34 0	33 14 5	26 26 0	9 13 30	5 47 0	6 42 4	24 28 0	31 21 0		30 21 1		Formula 6 Table 32 Specified limits 14	20	18							30 21 0	27 21 3	29 21 1	49 2 0	49 0 2	32 0 19	

NP—Not permitted. NR—Not restricted. NS—Not specified.

[1] Various exceptions for farm and construction equipment; public utility vehicles; house trailers; urban, suburban, and school buses; haulage of agricultural and forest products; at wheels of vehicles for safety accessories, on designated highways, and as administratively authorized.

[2] Various exceptions for utility vehicles and loads, house trailers and mobile homes.

[3] When not specified, limited to number possible in practical combinations within permitted length limits; various exceptions for farm tractors, mobile homes, etc.

[4] Legally specified or established by administrative regulation.

[5] Computed under the following conditions to permit comparison on a uniform basis between States with different types of regulation:

A. Front axle load of 8,000 pounds.

B. Maximum practical wheelbase within applicable length limits:

(1) Minimum front overhang of 3 feet.

(2) In the case of a 4-axle truck-tractor semitrailer, rear overhang computed as necessary to distribute the maximum possible uniform load on the maximum permitted length of semitrailer to the single drive-axle of the tractor and to the tandem axles of the semitrailer, within the permitted load limits of each.

(3) In the case of a combination having 5 or more axles, minimum possible combined front and rear overhang assumed to be 5 feet, with maximum practical load on maximum permitted length of semitrailer, subject to control of loading on axle groups and on total wheelbase as applicable.

C. Including statutory enforcement tolerances as applicable.

[6] Auto transports 13 feet 6 inches; Maryland also allows 13 feet 6 inches for vehicles loaded with hay or straw, or carrying flat glass.

[7] Does not apply to combinations of adjacent load-carrying single axles.

[8] 56,000 pounds on load-carrying axles, exclusive of steering-axle load.

[9] On specific routes in urban or suburban service under special permit from P.U.C. 40 feet, also 3-axle buses with turning radius less than 45 feet without restriction.

[10] Except 3-unit combinations may use up to 65 ft. combinations on certain highways designated by the Department of Highways.

[11] Buses 102 inches on highways of surfaced width at least 20 feet or otherwise as administratively authorized.

[12] On class AA, or designated highways, 12 ft. 6 in. on other highways; log and lumber trucks limited to 12 ft. 6 in. on all highways in Oregon.

[13] Legal limit 60,000 pounds, axle spacing 27 feet or more.

[14] Three-axle vehicles 40 feet.

[15] Truck 39.55 feet; bus 45.20 feet.

[16] 63,280 pounds maximum, except on roads under Rural Roads Authority 56,000 pounds maximum.

[17] 700 (L + 40) when L is 18' or less; 800 (L + 40) when L is greater than 18'; 900 (L + 40) on highways having no structures with span of 20' or over.

[18] Vehicles loaded with tobacco hogsheads—103 inches.

[19] Less than three axles 35 feet.

[20] Special limits for vehicles hauling timber and timber products, ores, concentrates, aggregates, and agricultural products including livestock; single axle 18,900 pounds, tandem axle 37,800 pounds, gross weight table: vehicle with 3 or 4 axles permitted 66,000 pounds maximum at 21-foot axle spacing, vehicle with 5 or more axles permitted 79,000 pounds maximum at 43-foot axle spacing.

[21] On designated highways; 16,000 pounds on other highways.

[22] Without tandem axles 45,000 pounds.

[23] On designated highways; single axle 22,400 pounds, tandem axle 36,000 pounds; tolerance of 1,000 pounds on total of all excesses of weight under one or more limitations of axle load and gross weight; depending upon the placing of 9000# on the front or steering axle.

[24] Towing agent must be registered for total gross weight of entire combination of vehicles except farmer having trailer registered as "Farm trailer."

[25] 60 ft. in special cases: Illinois, auto transports only; Indiana, trucks pulling house trailers only; Oregon, truck tractor semitrailers on designated major routes.

[26] On designated highways; trucks 26.5 feet and buses 30 feet on other highways.

[27] Class AA highways; 45 feet on other highways.

[28] Class AA highways only.

[29] Maximum gross weight on Class A highways 42,000 pounds; on Class B highways 30,000 pounds.

[30] Including load 14 feet; various exceptions for vehicles hauling forest products and construction materials.

[31] Tandem axles spaced less than 48 inches apart carry a gross weight limitation of 36,000 pounds.

[32] Subject to axle and tubular limits.

[33] Single axle spaced less than 9 feet from nearest axle limited to 13,000 pounds.

[34] On designated highways only and limited to one tandem axle in combination; otherwise 26,000 pounds.

[35] On designated highways only.

[36] Administrative regulation—32,000 pounds allowed on each set of tandum axles provided the distance between axles 2 and 5 is 28 ft. or more.

[37] Semitrailer and semitrailer converted to full trailer by means of a dolly.

[38] Dual-drive axles; otherwise 40,000 pounds.

[39] Or as prescribed by P.U.C.

[40] Exception for poles, pillings, structural units, rowing shells etc., permitted 70 feet.

[41] On designated highways 102 inches. Body restricted to 96", additional 6" for tires only.

[42] Trackless trolleys and buses 7 passengers or more, P.S.C. certificate 40 feet.

[43] Including front and rear bumpers.

[44] Vehicles in excess may be operated under special permit obtained in advance from the Department of Motor Vehicles; in North Dakota, from State Highway Truck Regulatory Department.

[45] Auto transports only, by special permit only, otherwise 50 feet.

[46] Any single axle exceeding 18,000 lbs. shall be equipped with 4 properly inflated tires.

[47] Logging vehicles permitted 7-foot wheelbase tolerance, 19,000-single axle, 34,000-pound tandem axle.

[48] Governs gross weight permitted on highways designated by resolution of State highway commission.

[49] Single unit truck with 4 axles permitted 60,000 pounds.

[50] Axles spaced less than 6 feet 32,000 pounds; less than 12 feet 36,000 pounds; 12 feet or more gross weight governed by axle limit.

[51] Single vehicle with 3 or more axles spaced less than 16 feet 40,000 pounds; less than 20 feet 44,000 pounds; 20 feet or more governed by axle limit.

[52] Tractor semitrailer with 3 or more axles spaced less than 22 feet 46,000 pounds; not less than 27 feet 50,000 pounds.

[53] Limited to 3,500 pounds.

[54] Several bridges posted at lower limits.

[55] On Interstate Routes: a. 30,000 lbs.; b. 40,000 lbs.; c. 50,000 lbs.; d. 60,000 lbs.

[56] Where truck-tractor was properly registered in Pennsylvania as of December 31, 1961, 55 feet.

[57] Vehicles registered before July 1, 1956, permitted limits in effect January 1, 1956, for life of vehicle.

[58] Three-unit combinations and full truck and full trailer combinations on designated highways.

[59] House trailers only, otherwise 55 feet.

[60] Axle load 21,000 pounds on 2-axle trucks hauling peeled or unpeeled forest products cut crosswise or transporting milk from farm to market but not over Interstate System.

[61] On Class A highways. All axles of a vehicle or combination—73,000 pounds maximum. Wheel, axle, axle group and gross vehicle weights on Class B highways are 60% of weights including tolerance authorized for Class A highways.

[62] Based on ruling of Attorney General.

[63] Weight limits to be established by administrative regulations.

[64] For axle spacing under 8 feet.

[65] Weights are established on axle spacing of the extreme of any group.

[66] Only on certain highways, or portions thereof, designated by State Roads Commission, and consistent with Congressional action.

[67] Mobile house and towing vehicle—50 feet except Noon to Midnight Sundays and other designated holidays.

STATE LEGAL MAXIMUM DIMENSIONS AND WEIGHTS OF MOTOR VEHICLES COMPARED WITH AASHO STANDARDS

Prepared by the Bueau of Public Roads

Decembe 31, 1963

Line	State	Width inches[1]	Height ft.-in.	Length-feet[2]					Number of towed units[3]			Axle load-pounds			
				Single unit			Truck tractor semi-trailer	Other combination	Semi-trailer	Full trailer	Semi-trailer and full trailer	Single		Tandem	
				Truck	Bus	Semi-trailer or trailer						Statutory limit	Including statutory enforcement tolerance	Statutory limit	Including statutory enforcement tolerance
1	Alabama	96	13-6	40	40	NS	55	NP	1	NP	NP	18,000	19,800	36,000	39,600
2	Alaska	96	12-6	35	[6]40	[7]40	60	60	1	1	2	18,000		32,000	
3	Arizona	96	13-6	40	40	NS	65	65	1	1	2	18,000		32,000	
4	Arkansas	96	13-6	40	40	NS	55	55	1	1	NP	[8]18,000		32,000	
5	California	96	13-6	35	[9]35	[7]40	60	65	NR	NR	NR	18,000		32,000	
6	Colorado	[10]96	[11]13-6	35	40	NR	60	[12]60	1	2	2	18,000		36,000	
7	Connecticut	102	12-6	50	50	NR	50	NP	1	NP	NP	22,400	22,848	36,000	36,720
8	Delaware	96	13-6	40	42	40	55	60	1	1	NP	20,000		36,000	
9	Florida	96	13-6	[13]35	40	[14]NS	55	55	1	1	NP	20,000	22,000	40,000	44,000
10	Georgia	96	13-6	[15]39	[15]45	NR	50	50	1	1	NP	18,000	20,340	36,000	40,680
11	Hawaii	108	13-0	40	40	NR	55	65	1	1	2	24,000		32,000	
12	Idaho	[10]96	14-0	[18]35	[18]35	NR	[19]60	65	1	1	2	[20]18,000		[20]32,000	
13	Illinois	96	13-6	42	42	42	[21]55	[22]60	1	1	2	[23]18,000		32,000	
14	Indiana	[10]96	13-6	36	40	NR	55	[21]55	1	1	2	[25]18,000	[25]19,000	[25]32,000	[25]33,000
15	Iowa	96	13-6	35	[6]40	[7]NS	[26]55	[26]55	1	1	2	18,000	18,540	32,000	32,960
16	Kansas	96	13-6	35	[6]40	NS	50	50	1	1	NP	18,000		32,000	
17	Kentucky	96	[11]13-6	[27]35	[27]35	NR	[28]50	[28]50	1	1	NP	18,000	[29]18,900	[29]32,000	33,600
18	Louisiana	96	13-6	35	[6]40	NR	55	60	1	1	NP	18,000		32,000	
19	Maine	102	[31]13-6	55	55	NR	55	55	1	1	NP	[31]22,000		[31]32,000	
20	Maryland	[32]96	[33]12-6	55	55	NR	55	[34]55	NR	NR	NR	22,400		[35]40,000	
21	Massachusetts	96	NS	35	[6]40	NR	50	NP	1	NP	NP	22,400		36,000	
22	Michigan	96	13-6	35	40	40	55	55	1	1	2	[37]18,000		[38]32,000	
23	Minnesota	96	13-6	40	40	40	50	50	1	1	NP	18,000		32,000	
24	Mississippi	96	13-6	35	40	NR	55	55	1	1	NP	18,000		28,650	[22]32,000
25	Missouri	96	12-6	35	40	NR	50	50	1	1	2	18,000		32,000	
26	Montana	[10]96	13-6	35	40	NR	60	60	1	1	2	18,000		32,000	
27	Nebraska	96	13-6	40	40	[39]NR	60	60	1	1	2	18,000	18,900	32,000	33,600
28	Nevada	96	NR	NR	NR	NR	NR	NR	NR	NR	NR	18,000	18,900	32,000	33,600
29	New Hampshire	96	13-6	35	[22]40	NR	55	55	NR	NR	NR	22,400		36,000	
30	New Jersey	[41]96	[41]13-6	35	[42]35	[7]40	53	50	1	1	NP	22,400	23,520	32,000	33,600
31	New Mexico	[43]96	13-6	40	40	NR	65	65	1	1	2	21,600		34,320	
32	New York	96	[33]13-0	35	[44]35	[7]NR	50	50	1	1	NP	22,400		36,000	
33	North Carolina	96	13-6	35	[6]40	NR	55	55	1	1	NP	18,000	19,000	36,000	38,000
34	North Dakota	[41]96	[41]13-6	[13]35	[6]40	NR	60	60	1	1	2	18,000		32,000	
35	Ohio	96	13-6	35	[6]40	[7]40	55	60	1	NR	NR	19,000		31,500	
36	Oklahoma	96	13-6	35	45	NR	[45]50	[45]50	1	1	NP	18,000		32,000	
37	Oregon	96	[11]13-6	35	[22]40	[22]40	[21]55	[22]65	1	1	[22]2	[46]18,000		[46]32,000	
38	Pennsylvania	96	[33]12-6	35	40	40	[48]50	[34]50	1	1	NP	22,400	23,072	36,000	37,080
39	Rhode Island	102	12-6	40	40	40	50	50	1	1	NP	22,400		NS	
40	South Carolina	96	13-6	40	[6]40	NR	55	[54]60	1	1	NP	20,000		[55]32,000	
41	South Dakota	96	13-6	35	40	NR	[22]65	[22]65	1	1	2	18,000		32,000	
42	Tennessee	96	13-6	35	40	[7]NS	50	50	1	[56]1	NP	18,000		32,000	
43	Texas	96	13-6	35	40	NS	50	50	1	1	NP	18,000		32,000	
44	Utah	96	14-0	45	45	45	60	60	NR	NR	NR	18,000		33,000	
45	Vermont	96	13-6	50	50	NS	55	55	1	1	NP	22,400	23,520	[57]36,000	
46	Virginia	96	13-6	35	40	NR	50	50	1	1	NP	18,000		[58]32,000	
47	Washington	96	13-6	35	[6]40	40	[19]60	65	1	1	2	18,000		32,000	
48	West Virginia	96	[33]12-6	35	[6]40	35	50	50	1	1	NP	18,000	18,900	32,000	33,600
49	Wisconsin	96	13-6	35	40	35	55	55	1	1	NP	18,000	[60]19,500	30,400	32,000
50	Wyoming	96	13-6	40	40	NR	65	65	1	1	2	18,000		32,000	[62]36,000
51	District of Columbia	96	12-6	40	40	NS	50	50	1	1	NP	22,000		38,000	
52	Puerto Rico	96	12-6	35	40	NS	50	50	1	1	NP	NS		NS	
	AASHO Policy	102	13-6	40	40	40	55	65	1	1	2	20,000		32,000	
	Number of States: Higher	1	4	7	10	35	14	1	5	7	6	16		26	
	Same	3	37	12	37	7	20	9	47	42	18	2		25	
	Lower	48	11	33	5	10	18	42	0	3	28	34		1	

Line	State	Operating tire inflation pressure pounds per sq. in.	Gross weight limit				Specified maximum gross weight-pounds[4]						Practical maximum gross weight-pounds[5]						Line
			Pounds per engine net horse-power delivered to clutch or equivalent	Type of restriction	Applicable to:		Truck		Truck-tractor semitrailer			Other combination	Truck		Truck-tractor semitrailer			Other combination	
					Any group of axles	Total wheel-base only	2-axle	3-axle	3-axle	4-axle	5-axle		2-axle	3-axle	3-axle	4-axle	5-axle		
1	Alabama	NS	NS	Table		X					73,280		27,800	47,600	47,600	67,400	73,280	NP	1
2	Alaska	NS	NS	Table-tire cap.	Under 18'	Over 18'	36,000	50,000	50,000	72,000	76,800	76,800	26,000	40,000	44,000	58,000	72,000	76,800	2
3	Arizona	NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,800	3
4	Arkansas	NS	NS	Spec. maximum									26,000	40,000	44,000	58,000	72,000	73,280	4
5	California	NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,800	5
6	Colorado	NS	NS	Formula-spec. lim.		X							26,000	44,000	44,000	62,000	76,000	76,000	6
7	Connecticut	NS	NS	Spec. lim.-tire cap.			32,000	53,800	53,800	67,400	73,000	NP	30,848	44,720	53,800	67,400	73,000	NP	7
8	Delaware	NS	NS	Table-spec. lim.	X		30,000	46,000	48,000				28,000	44,000	48,000	64,000	73,280	73,280	8
9	Florida	NS	NS	Table		X							30,000	52,000	52,000	73,271	73,271	73,271	9
10	Georgia	NS	NS	Spec. max.[16]								63,280	28,340	48,680	48,680	63,280	63,280	63,280	10
11	Hawaii	NS	NS	Formula[17]	X								32,000	40,000	56,000	64,000	72,000	80,000	11
12	Idaho	NS	NS	Table[20]	X								26,000	40,000	44,000	58,000	73,280	76,800	12
13	Illinois	NS	NS	Spec. lim.-tire cap.			36,000	50,000	50,000	64,000	[24]73,280	[24]73,280	26,000	40,000	44,000	58,000	72,000	73,280	13
14	Indiana	NS	NS	Spec. lim.-tire cap.			36,000	50,000	54,000			72,000	27,000	41,000	45,000	59,000	[25]73,000	[25]73,000	14
15	Iowa	NS	NS	Table	X								26,540	40,960	45,080	59,500	73,280	73,280	15
16	Kansas	NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	73,280	16
17	Kentucky	NS	NS	Spec. lim.-tire cap[30]			27,000	42,000	42,000	59,640	73,280	NP	27,000	42,000	42,000	59,640	73,280	73,280	17
18	Louisiana	NS	NS	Axle lim.-tire cap.									26,000	40,000	44,000	58,000	72,000	76,000	18
19	Maine	NS	NS	Table-tire cap.	X		32,000	[31]51,800	51,800	62,050	73,280	73,280	30,000	40,000	51,800	62,000	72,000	73,280	19
20	Maryland	NS	NS	Table		X			[36]65,000	[36]73,280	[36]73,280	[36]73,280	30,400	48,000	52,800	70,400	73,280	73,280	20
21	Massachusetts	NS	NS	Table-spec. lim.			[36]46,000	[36]60,000	[36]60,000	[36]73,000	[36]73,000	NP	30,400	44,000	52,800	66,400	73,000	NP	21
22	Michigan	NS	NS	Axle lim.-tire cap.									26,000	[22]40,000	44,000	[22]58,000	[22]66,000	[22]102,000	22
23	Minnesota	NS	NS	Table	X						73,280	73,280	26,000	40,000	44,000	58,000	72,000	73,280	23
24	Mississippi	NS	NS	Table-tire cap.	X								26,000	[22]40,000	44,000	58,000	[22]64,650	[22]73,280	24
25	Missouri	NS	NS	Table	X								26,000	40,000	44,000	58,000	[22]72,000	[22]73,280	25
26	Montana	NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,000	26
27	Nebraska	NS	NS	Table	X		36,000	54,000	54,000	71,146	71,146	71,146	26,780	41,200	45,320	59,740	73,280	73,280	27
28	Nevada	NS	NS	Table	Under 18'	Over 18'							26,900	41,600	45,800	60,500	75,200	76,800	28
29	New Hampshire	NS	NS	Table-spec. lim.		X	33,400	[40]55,000	[40]55,000	66,400	73,280	73,280	30,400	44,000	52,800	66,400	73,280	73,280	29
30	New Jersey	NS	NS	Axle lim.-tire cap.									31,520	41,600	55,040	65,120	73,280	73,280	30
31	New Mexico	NS	NS	Table	Under 18'	Over 18'							29,600	42,320	51,200	63,920	76,640	86,400	31
32	New York	NS	NS	Formula		X					71,000	71,000	30,400	44,000	52,800	66,400	71,000	71,000	32
33	North Carolina	NS	NS	Spec. lim.			31,500	49,875	49,875	67,200	73,280	73,280	27,000	46,000	46,000	65,000	73,280	73,280	33
34	North Dakota	NS	NS	Formula	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	73,280	34
35	Ohio	NS	NS	Formula		X							27,000	39,500	46,000	58,500	71,000	78,000	35
36	Oklahoma	NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	73,280	36
37	Oregon	NS	NS	Table[47]	Under 18'	Over 18'					[47]76,000	[47]76,000	26,000	40,000	44,000	58,000	72,000	[47]76,000	37
38	Pennsylvania	NS	NS	Spec. lim.[49]			33,000	47,000	50,000	60,000	71,145	71,145	31,072	45,080	51,500	61,800	73,280	73,280	38
39	Rhode Island	NS	NS	Spec. lim.			[50]36,000	[51]44,000	[52]53,800	[53]67,400	73,280	88,000	30,400	44,000	53,800	67,400	73,280	88,000	39
40	South Carolina	NS	NS	Spec. lim.			32,000	46,000	50,000	65,000	73,280	73,280	28,000	40,000	48,000	60,000	72,000	73,200	40
41	South Dakota	NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	73,280	41
42	Tennessee	NS	NS	Table		X		44,000	48,000	62,000	73,280		26,000	40,000	44,000	58,000	72,000	43,500	42
43	Texas	NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	72,000	43
44	Utah	NS	NS	Table	X		36,000	51,000	54,000	69,000	79,900	79,900	26,000	41,000	44,000	59,000	74,000	79,900	44
45	Vermont	NS	NS	Table-tire cap.	X						73,280	73,280	31,520	44,000	55,000	66,400	73,280	73,280	45
46	Virginia	NS	NS	Table	X						70,000	70,000	26,000	40,000	44,000	60,000	70,000	70,000	46
47	Washington	NS	NS	Table	Under 18'	Over 18'	28,000	36,000	46,000	60,000	68,000	72,000	26,000	36,000	44,000	60,300	68,000	72,000	47
48	West Virginia	NS	NS	Table	X					[59]70,000	[59]70,000	[59]70,000	26,900	41,600	45,800	60,500	73,280	73,280	48
49	Wisconsin	NS	NS	Table[61]	X								27,500	40,000	47,000	59,500	73,000	73,000	49
50	Wyoming	NS	NS	Table	X								26,000	44,000	44,000	62,000	73,950	73,950	50
51	District of Columbia	NS	NS	Table-tire cap.	X					70,000	70,000	70,000	30,000	46,000	52,000	68,000	70,000	70,000	51
52	Puerto Rico	NS	NS	Spec. lim.-tire cap.															52
	AASHO Policy	95	400	Table	X								28,000	40,000	48,000	60,000	72,000	86,500	
	Number of States: Higher	52	52	Formula 5	20	17							15	25	15	22	24	2	
	Same	0	0	Table 32									2	24	2	3	19	0	
	Lower	0	0	Spec. lim. 15									34	2	34	26	8	49	

NP—Not permitted. NR—Not restricted. NS—Not specified.

[1] Various exceptions for farm and construction equipment; public utility vehicles; house trailers; urban, suburban, and school buses; haulage of agricultural and forest products; at wheels of vehicles for safety accessories, on designated highways, and as administratively authorized.

[2] Various exceptions for utility vehicles and loads, house trailers and mobile homes.

[3] When not specified, limited to number possible in practical combinations within permitted length limits; various exceptions for farm tractors, mobile homes, etc.

[4] Legally specified or established by administrative regulation.

[5] Computed under the following conditions to permit comparison on a uniform basis between States with different types of regulation:

A. Front axle load of 8,000 pounds.

B. Maximum practical wheelbase within applicable length limits:

(1) Minimum front overhang of 3 feet; minimum spacing from first to second axle of truck tractor 8 feet.

(2) In the case of a 4-axle truck-tractor semitrailer, rear overhang computed as necessary to distribute the maximum possible uniform load on the maximum permitted length of semitrailer to the single drive-axle of the tractor and to the tandem axles of the semitrailer, within the permitted load limits of each.

(3) In the case of a combination having 5 or more axles, minimum possible combined front and rear overhang assumed to be 5 feet, with maximum practical load on maximum permitted length of semitrailer, subject to control of loading on axle groups and on total wheelbase as applicable.

C. Including statutory enforcement tolerance as applicable.

[6] Less than three axles 35 feet.

[7] Trailer 35 feet.

[8] Steering axle 12,000 pounds.

[9] On specific routes in urban or suburban service under special permit from P.U.C. 40 feet, also 3-axle buses with turning radius less than 45 feet without restriction.

[10] Buses 102 inches on highways of surfaced width at least 20 feet or otherwise as administratively authorized.

[11] On class AA, or designated highways, 12 ft. 6 in. on other highways; log and lumber trucks limited to 12 ft. 6 in. on all highways in Oregon.

[12] Except 3-unit combinations may use up to 65 ft. combinations on certain highways designated by the Department of Highways.

[13] Three-axle vehicles 40 feet.

[14] Two-axle trailer 35 feet; three-axle trailer 40 feet.

[15] Truck 39.55 feet; bus 45.20 feet.

[16] 63,280 pounds maximum, except on roads under Rural Roads Authority 56,000 pounds maximum.

[17] 700 (L + 40) when L is 18' or less; 800 (L + 40) when L is greater than 18', 900(L + 40) on highways having no structures with span of 20' or over.

[18] On designated highways 40 feet.

[19] Auto transports on designated highways 65 feet.

[20] Special limits for vehicles hauling timber and timber products, ores, concentrates, aggregates, and agricultural products including livestock; single axle 18,900 pounds, tandem axle 37,800 pounds, gross weight table: vehicle with 3 or 4 axles permitted 66,000 pounds maximum at 21-foot axle spacing, vehicle with 5 or more axles permitted 79,000 pounds maximum at 43-foot axle spacing.

[21] 60 ft. in special cases: Illinois, auto transports only; Indiana, trucks pulling house trailers only; Oregon, truck tractor semi-trailers on designated major routes.

[22] On designated highways only.

[23] On designated highways; 16,000 pounds on other highways.

[24] Axle spacing 44 feet or more; otherwise 72,000 pounds.

[25] On designated highways; single axle 22,400 pounds, tandem axle 36,000 pounds; tolerance of 1,000 pounds on total of all excesses of weight under one or more limitations of axle load and gross weight; depending upon the placing of 9000# on the front or steering axle.

[26] Auto and boat transports and three-unit combinations permitted 60 feet on highways with surface width 22 feet or more; otherwise 50 feet.

[27] On designated highways; trucks 26.5 feet and buses 30 feet on other highways.

[28] Class AA highways; 45 feet on other highways.

[29] Class AA highways only.

[30] Maximum gross weight on Class A highways 42,000 pounds,, on Class B highways 30,000 pounds.

[31] Including load 14 feet; various exceptions for vehicles haulling forest products and construction materials.

[32] Vehicles loaded with tobacco hogsheads—103 inches.

[33] Auto transports 13 feet 6 inches; Maryland also allows 13 feet 6 inches for vehicles loaded with hay or straw, or carrying flat glass.

[34] Exception for poles, pilings, structural units, rowing sheelss etc., permitted 70 feet.

[35] Less than 48-inch spacing, 36,000 pounds.

[36] Subject to axle and tabular limits.

[37] Single axle spaced less than 9 feet from nearest axle limiteed to 13,000 pounds.

[38] On designated highways only and limited to one tandem axle in combination; otherwise 26,000 pounds.

[39] Trailer 40 feet.

[40] On Interstate System 47,500 pounds.

[41] Vehicles in excess may be operated under special permit obtained in advance; in New Jersey from the Department of Motor Vehicles; in North Dakota, from State Highway Truck Regulatory Department.

[42] Or as prescribed by P.U.C.

[43] On designated highways 102 inches. Body restricted to 96", additional 6" for tires only.

[44] Trackless trolleys and buses 7 passengers or more, P.S.C. certificate 40 feet.

[45] Auto transports, oil field equipment, by special permit only, 60 feet.

[46] Logging vehicles permitted 7-foot wheelbase tolerance, 19,000-single axle, 34,000-pounds tandem axle.

[47] Governs gross weight permitted on highways designated by resolution of State highway commission.

[48] Where truck-tractor was properly registered in Pennsylvania as of December 31, 1961, 55 feet.

[49] Single unit truck with 4 axle permitted 60,000 pounds.

[50] Axles spaced less than 6 feet 32,000 pounds; less than 12 feet 36,000 pounds; 12 feet or more gross weight governed by axle limit.

[51] Single vehicle with 3 or more axles spaced less than 16 feet 40,000 pounds, less than 20 feet 44,000 pounds, 20 feet or more governed by axle limit.

[52] Tractor semitrailer with 3 or more axles spaced less than 22 feet 46,000 pounds, not less than 27 feet 53,800 pounds.

[53] Legal limit 67,400 pounds, axle spacing 27 feet or more.

[54] House trailers only, otherwise 55 feet.

[55] On Interstate System, 36,000 pounds on other roads.

[56] Limited to 3,500 pounds.

[57] Three-axle tandem 42,700 pounds.

[58] Vehicles registered before July 1, 1956, permitted limits in effect January 1, 1956, for life of vehicle.

[59] Only on certain highways, or portions thereof, designated by State Roads Commissioner, and consistent with Congressional action.

[60] Axle load 21,000 pounds on 2-axle trucks hauling peeled or unpeeled forest products cut crosswise or transporting milk from farm to market but not over Interstate System.

[61] On Class A highways. All axles of a vehicle or combination—73,000 pounds maximum. Wheel, axle, axle group and gross vehicle weights on Class B highways are 60% of weights including tolerance authorized for Class A highways.

[62] Based on ruling of Attorney General.

STATE LEGAL MAXIMUM DIMENSIONS AND WEIGHTS OF MOTOR VEHICLES COMPARED WITH AASHO STANDARDS

Prepared by the American Association of State Highway Officials

December 31, 1967

Line	State	Width inches[1]	Height ft.-in.	Length feet[2]					Number of towed units[3]			Axle load pounds				Operating tire inflation pressure pounds per sq. in.	Gross weight limit				Specified maximum gross weight pounds[4]						Practical maximum gross weight pounds[5]						Line
				Single unit								Single		Tandem			Pounds per engine net horsepower delivered to clutch or equivalent	Type of restriction	Applicable to		Truck		Truck-tractor semitrailer			Other combination	Truck		Truck-tractor semitrailer			Other combination	
				Truck	Bus	Semitrailer or trailer	Truck tractor semitrailer	Other combination	Semitrailer	Full trailer	Semitrailer and full trailer	Statutory limit	Including statutory enforcement tolerance	Statutory limit	Including statutory enforcement tolerance				Any group of axles	Total wheelbase only	2-axle	3-axle	3-axle	4-axle	5-axle		2-axle	3-axle	3-axle	4-axle	5-axle		
1	Alabama	96	13-6	40	40	NS	55	NP	1	NP	NP	18,000	19,800	36,000	39,600	NS	NS	Table		X					73,280		27,800	47,600	47,600	67,400	73,280	NP	1
2	Alaska	96	13-6	40	[6]40	[7]40	60	65	1	1	2	20,000		34,000		NS	NS	Table-tire cap.	Under 18'	Over 18'	30,000	44,000	50,000	64,000	78,000	100,000	28,000	42,000	48,000	62,000	76,000	90,000	2
3	Arizona	96	13-6	40	40	NS	65	65	1	1	2	18,000		32,000		NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,800	3
4	Arkansas	96	13-6	40	40	NS	55	65	NR	NR	NR	[8]18,000		32,000		NS	NS	Spec. maximum									26,000	40,000	44,000	58,000	72,000	73,280	4
5	California	96	[9]13-6	40	40	[7]40	60	65	NR	NR	NR	18,000		32,000		NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,800	5
6	Colorado	[10]96	[11]13-6	35	40	NR	60	[12]60	1	2	2	18,000		36,000		NS	NS	Formula-spec. lim.		X							26,000	44,000	44,000	62,000	76,000	76,000	6
7	Connecticut	102	13-6	55	55	40	55	NP	1	NP	NP	22,400	22,848	36,000	36,720	NS	NS	Spec. lim.-tire cap.			32,000	53,800	53,800	67,400	73,000	NP	30,848	44,720	53,800	67,400	73,000	NP	7
8	Delaware	96	13-6	40	42	40	55	60	1	1	NP	[63]20,000		36,000		NS	NS	Table-spec. lim.	X		30,000	65,000	48,000				28,000	44,000	48,000	64,000	73,280	73,280	8
9	Florida	96	13-6	[13]35	40	[14]NS	55	55	1	1	NP	20,000	22,000	40,000	44,000	NS	NS	Table		X							30,000	52,000	52,000	73,271	73,271	73,271	9
10	Georgia	96	13-6	55	55	NR	55	55	NR	NR	NR	18,000	20,340	36,000	40,680	NS	NS	Spec. max.[16]							73,280	73,280	28,340	48,680	48,680	69,110	73,280	73,280	10
11	Hawaii	108	13-0	40	40	NR	55	65	1	1	2	24,000		32,000		NS	NS	Formula[17]	X								32,000	40,000	56,000	64,000	72,000	80,000	11
12	Idaho	[10]96	14-0	[18]35	[18]35	NR	[19]60	[64]65	1	1	2	[20]18,000		[20]32,000		NS	NS	Table[20]	X								26,000	40,000	44,000	58,000	73,280	76,800	12
13	Illinois	96	13-6	42	42	42	[21]55	60	1	1	2	[23]18,000		32,000		NS	NS	Spec. lim.-tire cap.			36,000	50,000	50,000	64,000	[24]73,280	[24]73,280	26,000	40,000	44,000	58,000	72,000	73,280	13
14	Indiana	[10]96	[70]13-6	36	40	NR	55	65	1	1	2	[25]18,000	[25]19,000	[25]32,000	[25]33,000	NS	NS	Spec. lim.-tire cap.			36,000	50,000	54,000			72,000	26,000	40,000	44,000	58,000	[25]73,000	[25]73,000	14
15	Iowa	96	13-6	35	[6]40	[7]NR	[26]55	[26]55	1	1	2	18,000	18,540	32,000	32,960	NS	NS	Table	X								26,540	40,960	45,080	59,500	73,280	73,280	15
16	Kansas	96	13-6	42' 6"	[6]40	42' 6"	55	[65]50	NR	NR	NR	18,000		32,000		NS	NS	Table		X							26,000	40,000	44,000	58,000	72,000	73,280	16
17	Kentucky	96	13-6	[27]35	[27]35	NR	[54]55	[65]65	1	1	2	18,000	18,900	32,000	33,600	NS	NS	Spec. lim.-tire cap.			30,000	44,000	44,000	62,000	73,280	73,280	27,000	42,000	42,000	59,640	73,280	73,280	17
18	Louisiana	96	13-6	35	[6]40	NR	60	65	1	1	NP	18,000		32,000		NS	NS	Axle lim.-tire cap.									26,000	40,000	44,000	58,000	72,000	76,000	18
19	Maine	[28]102	[11]13-6	55	55	NR	55	55	1	1	NP	[11]22,000		[28]36,000		NS	NS	Table-tire cap.	X		32,000	[11]51,800	51,800	66,300	73,280	73,280	30,000	44,000	51,800	66,000	73,280	73,280	19
20	Maryland	[32]96	13-6	55	55	NR	55	[30]65	NR	NR	NR	22,400		[35]40,000		NS	NS	Table		X			[36]55,000	[36]65,000	[36]73,280	[36]73,280	30,400	48,000	52,800	65,000	73,280	73,280	20
21	Massachusetts	96	NS	35	[6]40	NR	55	NP	1	NP	NP	22,400		36,000		NS	NS	Table-spec. lim.		X	[36]46,000	[36]60,000	[36]60,000	[36]73,000	[36]73,000	NP	30,400	44,000	52,800	66,400	73,000	NP	21
22	Michigan	96	13-6	35	40	40	[15]55	[22]65	1	1	2	[37]18,000		[38]32,000		NS	NS	Axle lim.-tire cap.							73,280		26,000	[22]40,000	44,000	[22]58,000	[22]66,000	[22]102,000	22
23	Minnesota	96	13-6	40	40	[66]40	55	55	1	1	NP	18,000		32,000		NS	NS	Table	X						73,280	73,280	26,000	40,000	44,000	58,000	72,000	73,280	23
24	Mississippi	96	13-6	35	40	NR	55	55	1	1	NP	18,000		28,650	[22]32,000	NS	NS	Table-tire cap.	X								26,000	[22]40,000	44,000	58,000	[22]72,000	[22]73,280	24
25	Missouri	96	13-6	40	40	NR	55	[72]50	1	1	2	18,000		32,000		NS	NS	Table		X							26,000	40,000	44,000	58,000	[22]72,000	[22]73,280	25
26	Montana	[10]96	13-6	35	40	NR	60	60	1	1	2	18,000		32,000		NS	NS	Table	Under 18'	Over 18'							26,000	40,000	44,000	58,000	72,000	76,000	26
27	Nebraska	96	13-6	40	40	[39]NR	60	60	1	1	2	18,000	18,900	32,000	33,600	NS	NS	Table	X		36,000	54,000	54,000	71,146	71,146	71,146	26,780	41,200	45,320	59,740	73,280	73,280	27
28	Nevada	96	NR	40	40	NR	[45]70	[45]70	NR	NR	NR	18,000	18,900	32,000	33,600	NS	NS	Table	Under 18'	Over 18'							26,900	41,600	45,800	60,500	75,200	76,800	28
29	New Hampshire	96	13-6	35	40	NR	55	55	NR	NR	NR	22,400		36,000		NS	NS	Table-spec. lim.		X	33,400	[40]55,000	52,800	66,400	73,280	73,280	30,400	44,000	52,800	66,400	73,280	73,280	29
30	New Jersey	[41]96	[41]13-6	35	[42]35	[7]40	55	50	1	1	NP	22,400	23,520	32,000	33,600	NS	NS	Axle lim.-tire cap.									31,520	41,600	55,040	65,120	73,280	73,280	30
31	New Mexico	[43]96	13-6	40	40	NR	65	65	1	1	2	21,600		34,320		NS	NS	Table	Under 18'	Over 18'							29,600	42,320	51,200	63,920	76,640	86,400	31
32	New York	96	13-6	35	40	35	55	55	1	1	NP	22,400		36,000		NS	NS	Formula		X					71,000	71,000	30,400	44,000	52,800	66,400	71,000	71,000	32
33	North Carolina	96	13-6	35	[6]40	NR	55	55	1	1	NP	18,000	19,000	36,000	38,000	NS	NS	Spec. lim.			31,500	49,875	49,875	67,200	73,280	73,280	27,000	46,000	46,000	65,000	73,280	73,280	33
34	North Dakota	[41]96	[41]13-6	[13]35	[6]40	NR	[12]60	[12]60	1	1	2	18,000		32,000		NS	NS	Formula	Under 18	Over 18'							26,000	40,000	44,000	58,000	72,000	73,280	34
35	Ohio	96	13-6	40	[6]40	NR	55	65	1	NR	NR	19,000	19,570	[44]32,000	32,960	NS	NS	Formula[51]		X							27,000	39,500	46,000	58,500	71,000	78,000	35
36	Oklahoma	96	13-6	40	45	NR	[45]55	65	1	1	NS	18,000		32,000		NS	NS	Table	X		[67]18,000	[67]32,000	[67]36,000	[67]50,000	[67]64,000	73,280	26,000	42,000	44,000	60,000	73,280	73,280	36
37	Oregon	96	[68]13-6	35	[22]40	[22]40	[21]60	[22]75	1	1	[22]2	[46]20,000		[46]34,000		NS	NS	Table[47]	Under 18'	Over 18'					[47]76,000	[47]76,000	[69]28,000	[69]42,000	[69]48,000	[69]62,000	[69]76,000	[47]76,000	37
38	Pennsylvania	96	13-6	35	40	40	55	[34]55	1	1	NP	22,400	23,072	36,000	37,080	NS	NS	Spec. lim.[49]			33,000	47,000	50,000	60,000	71,145	71,145	31,072	45,080	51,500	61,800	73,280	73,280	38
39	Rhode Island	102	13-6	40	40	40	55	55	1	1	NP	22,400		NS		NS	NS	Spec. lim.			[50]36,000	[51]44,000	[52]53,800	[53]67,400	73,280	88,000	30,400	44,000	53,800	67,400	73,280	88,000	39
40	South Carolina	96	13-6	[6]40	[6]40	NR	55	[54]55	1	1	NP	20,000		[55]32,000		NS	NS	Spec. lim.			35,000	46,000	50,000	65,000	73,280	73,280	28,000	40,000	48,000	60,000	72,000	73,280	40
41	South Dakota	96	13-6	35	40	NR	[22]65	[22]65	1	1	2	18,000		32,000		NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	73,280	41
42	Tennessee	96	13-6	40	40	NS	55	55	1	[56]1	NP	18,000		32,000		NS	NS	Table-spec. lim.		X		44,000	48,000	62,000	73,280		26,000	40,000	44,000	58,000	72,000	43,500	42
43	Texas	96	13-6	40	40	[48]40	55	65	NR	NR	NR	18,000		32,000		NS	NS	Table	X								26,000	40,000	44,000	58,000	72,000	72,000	43
44	Utah	96	14-0	45	45	45	60	60	NR	NR	NR	18,000		33,000		NS	NS	Table	X		36,000	51,000	54,000	69,000	79,900	79,900	26,000	41,000	44,000	59,000	74,000	79,900	44
45	Vermont	96	13-6	50	50	NS	55	55	1	1	NP	22,400	23,520	[57]36,000		NS	NS	Table-tire cap.	X						73,280	73,280	31,520	44,000	55,000	66,400	73,280	73,280	45
46	Virginia	96	13-6	35	40	NR	50	50	1	1	NP	18,000		[58]32,000		NS	NS	Table		X					70,000	70,000	26,000	40,000	44,000	60,000	70,000	70,000	46
47	Washington	96	13-6	35	[6]40	40	[19]60	65	1	1	2	18,000		32,000		NS	NS	Table	Under 18'	Over 18'	28,000	36,000	46,000	60,000	68,000	72,000	26,000	36,000	44,000	60,000	68,000	72,000	47
48	West Virginia	96	[33]12-6	35	[6]40	35	50	50	1	1	NP	18,000	18,900	32,000	33,600	NS	NS	Table	X					[59]70,000	[59]70,000	[59]70,000	26,900	41,600	45,800	60,500	73,280	73,280	48
49	Wisconsin	96	13-6	35	40	35	55	55	1	1	NP	18,000	[60]19,500	30,400	32,000	NS	NS	Table[61]	X								27,500	40,000	47,000	59,500	73,000	73,000	49
50	Wyoming	96	13-6	50	40	NR	65	[34]65	1	1	2	18,000		32,000	[62]36,000	NS	NS	Table	X								26,000	44,000	44,000	62,000	73,950	73,950	50
51	District of Columbia	96	12-6	40	40	NS	50	50	1	1	NP	22,000		38,000		NS	NS	Table-tire cap.	X						70,000	70,000	30,000	46,000	52,000	68,000	70,000	70,000	51
52	Puerto Rico	96	13-6	35	40	NS	50	50	1	1	NP	NS		NS		NS	NS	Spec. lim.-tire cap.															52
	AASHO Policy - 1946	96	12-6	35	40		50	60	1	1	NP	18,000		32,000		NS	NS	Table	X								26,000	40,000	44,000	55,470	61,490	71,900	
	Number of States: Higher Same Lower	4 48 0	50 2 0	29 23 0	8 41 3		48 4 0	20 7 25	9 43 0	11 38 3		20 32 0		29 23 0													28 23 0	28 21 2	27 23 1	51 0 0	51 0 0	45 0 6	
	AASHO Policy - 1968	102	13-6	40	40	40	55	65	1	1	2	20,000		32,000		95	400	Table	X								28,000	40,000	48,000	60,000	72,000	86,500	
	Number of States: Higher Same Lower	1 3 48	4 45 3	9 19 24	8 41 3	37 12 3	15 32 4	2 18 32	9 43 0	11 38 3	11 19 22	16 4 32		29 23 0		[73]	[73]	Formula 5 Table 33 Spec. lim. 14	18	21							15 4 32	28 21 2	15 4 32	24 4 23	25 20 6	3 0 48	

NP—Not permitted. NR—Not restricted. NS—Not specified.

[1] Various exceptions for farm and construction equipment, public utility vehicles, house trailers, urban, suburban, and school buses, haulage of agricultural and forest products, at wheels of vehicles for safety accessories, on designated highways, and as administratively authorized.

[2] Various exceptions for utility vehicles and loads, house trailers, mobile homes and urban, suburban and school buses.

[3] When not specified, limited to number possible in practical combinations within permitted length limits, various exceptions for farm tractors, mobile homes, etc.

[4] Legally specified or established by administrative regulation.

[5] Computed under the following conditions to permit comparison on a uniform basis between States with different types of regulation:

A. Front axle load of 8,000 pounds.

B. Maximum practical wheelbase within applicable length limits:

(1) Minimum front overhang of 3 feet, minimum spacing from first to second axle of truck tractor 8 feet.

(2) In the case of a 4-axle truck-tractor semitrailer, rear overhang computed as necessary to distribute the maximum possible uniform load on the maximum permitted length of semitrailer to the single drive-axle of the tractor and to the tandem axles of the semitrailer, within the permitted load limits of each.

(3) In the case of a combination having 5 or more axles, minimum possible combined front and rear overhang assumed to be 5 feet, with maximum practical load on maximum permitted length of semitrailer, subject to control of loading on axle groups and on total wheelbase as applicable.

C. Including statutory enforcement tolerance as applicable.

[6] Less than three axles 35 feet.

[7] Trailer 35 feet.

[8] Steering axle 12,000 pounds.

[9] Load on vehicle may exceed 13' 6" but not exceed 14' 0", in effect until January 1, 1970.

[10] Buses 102 inches on highways of surfaced width at least 20 feet or otherwise as administratively authorized.

[11] On class AA, or designated highways, 12 ft. 6 in. on other highways.

[12] Except 3-unit combinations may use up to 65 ft. combinations on certain highways designated by the Department of Highways.

[13] Three-axle vehicles 40 feet.

[14] Two-axle trailer 35 feet, three-axle trailer 40 feet.

[15] Auto transports permitted 63 feet.

[16] 73,280 pounds maximum, except on roads under Rural Roads Authority 56,000 pounds maximum.

[17] 700 (L + 40) when L is 18' or less, 800 (L + 40) when L is greater than 18', 900 (L + 40) on highways having no structures with span of 20' or over.

[18] On designated highways 40 feet.

[19] Auto transports on designated highways 65 feet, if equipped as specified.

[20] Special limits for vehicles hauling timber and timber products, ores, concentrates, aggregates, and agricultural products including livestock, single axle 18,900 pounds, tandem axle 37,800 pounds, gross weight table vehicle with 3 or 4 axles permitted 66,000 pounds maximum at 21-foot axle spacing, vehicle with 5 or more axles permitted 79,000 pounds maximum at 43-foot axle spacing.

[21] 60 ft. in special cases Illinois, auto transports only, Indiana, trucks pulling house trailers and sectionalized buildings only. Oregon, truck tractor semi-trailers on designated major routes, otherwise 50 feet.

[22] On designated highways only.

[23] On designated highways, 16,000 pounds on other highways.

[24] Axle spacing 44 feet or more, otherwise 72,000 pounds.

[25] On designated highways, single axle 22,400 pounds, tandem axle 36,000 pounds, tolerance of 1,000 pounds on total of all excesses of weight under one or more limitations of axle load and gross weight, depending upon the placing of 9000 # on the front or steering axle.

[26] Auto and boat transports and three-unit combinations permitted 60 feet on highways with surface width 22 feet or more, otherwise 50 feet for all combinations.

[27] On state maintained highways, trucks 26.5 feet and buses 30 feet on other highways.

[28] On Interstate System only maximum width 96 inches, tandem axle load 32,000 pounds, 3-axle truck—40,000 pounds, 4-axle truck-tractor semitrailer—62,000 pounds, 5-axle truck-tractor semitrailer 72,000 pounds.

[29] Class AA highways only.

[30] On four lane highways only.

[31] Including load 14 feet, various exceptions for vehicles hauling forest products and construction materials.

[32] Vehicles loaded with tobacco hogsheads—103 inches.

[33] Auto transports 13 feet 6 inches, other vehicles 13 feet 6 inches on designated routes.

[34] Exception for poles, pilings, structural units, rowing sheels etc., permitted 70 feet.

[35] Less than 48-inch spacing, 36,000 pounds.

[36] Subject to axle and tabular limits.

[37] Single axle spaced less than 9 feet from nearest axle limited to 13,000 pounds.

[38] On designated highways only and limited to one tandem axle in combination, otherwise 26,000 pounds.

[39] Trailer 40 feet.

[40] On Interstate System 47,500 pounds.

[41] Vehicles in excess may be operated under special permit obtained in advance, in New Jersey from the Department of Motor Vehicles, in North Dakota, from State Highway Truck Regulatory Department.

[42] Or as prescribed by P.U.C.

[43] On designated highways 102 inches. Body restricted to 96", additional 6" for tires only.

[44] 32,000 pounds if over 4 feet but less than 8 feet apart, 24,000 pounds if less than 4 feet apart, 38,000 pounds if more than 8 feet.

[45] Auto transports, oil field equipment, by special permit only, 60 feet.

[46] On Interstate System logging vehicles limited to 19,000 pound single axle, other vehicles limited to 18,000 pound single axle and 32,000 pound tandem axle.

[47] Governs gross weight permitted on highways designated by resolution of State highway commission.

[48] Does not apply if overall length of truck tractor plus semitrailer does not exceed 50 feet.

[49] Single unit truck with 4 axle permitted 60,000 pounds.

[50] Axles spaced less than 6 feet 32,000 pounds, less than 12 feet 36,000 pounds, 12 feet or more gross weight governed by axle limit.

[51] Single vehicle with 3 or more axles spaced less than 16 feet 40,000 pounds less than 20 feet 44,000 pounds, 20 feet or more governed by axle limit.

[52] Tractor semitrailer with 3 or more axles spaced less than 22 feet 46,000 pounds, not less than 27 feet 53,800 pounds.

[53] Legal limit 67,400 pounds, axle spacing 27 feet or more.

[54] House trailers, auto transports, and double saddle mounts in daylight hours, 60 feet.

[55] On Interstate System, 36,000 pounds on other roads.

[56] Limited to 3,500 pounds.

[57] Three-axle truck. 42,700 pounds on tandem.

[58] Vehicles registered before July 1, 1956, permitted limits in effect January 1, 1956, for life of vehicle.

[59] Only on certain highways, or portions thereof, designated by State Roads Commissioner, and consistent with Congressional action.

[60] Axle load 21,000 pounds on 2-axle trucks hauling peeled or unpeeled forest products cut crosswise or transporting milk from farm to market but not over Interstate System.

[61] On Class A highways. All axles of a vehicle or combination—73,000 pounds maximum. Wheel, axle, axle group and gross vehicle weights on Class B highways are 60% of weights including tolerance authorized for Class A highways.

[62] Based on ruling of Attorney General.

[63] Axle load 21,700 pounds on 3-axle trucks. Total not to exceed 65,000 pounds. Does not apply on any Interstate Route or Turnpike.

[64] Except three or four unit combinations may use up to 98 feet on certain highways designated by the Board of Highway Directors.

[65] 60 feet for specially designed transports for boats or motor vehicles 65 feet for other combinations on designated highways.

[66] 45 feet for trailers or semi-trailers constructed especially to haul livestock, boats or motor vehicles.

[67] Weight shown plus front steering axle not to exceed 18,000 pounds.

[68] Auto transports 14 feet by permit on designated highways.

[69] On Interstate System—26,000, 40,000, 44,000, 58,000 and 72,000 pounds respectively.

[70] Mobile Homes and sectionalized buildings 12 feet 6 inches.

[71] 38,000 plus 900 L but not greater than 78,000 where L is the distance in feet from front to rear axle.

[72] Auto transports permitted 60 feet. Double bottom units permitted 65 feet.

[73] Not yet specified in any state law.

MOTION FILED
JUL 8 1980

No. 79-1320

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

RAYMOND KASSEL, ET AL., *Appellants,*

v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A Delaware Corporation, *Appellee.*

On Appeal from the United States Court of Appeals for the Eighth Circuit

MOTION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF AND BRIEF OF THE ASSOCIATION OF AMERICAN RAILROAD AS *AMICUS CURIAE*

HARRY J. BREITHAUPT, JR.
DAVID W. DONLEY

ASSOCIATION OF AMERICAN
RAILROADS
1920 L Street, N.W.
Washington, D.C. 20036
(202) 293-4096

Attorneys for the Association of American Railroads

PRESS OF BYRON S. ADAMS PRINTING, INC., WASHINGTON, D.C.

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CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A Delaware Corporation, *Appellee.*

On Appeal from the United States Court of Appeals for the Eighth Circuit

MOTION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF

The Association of American Railroads respectfully moves for leave to file the attached brief as *amicus curiae.* The brief supports the appeal of Raymond Kassel, *et al.*, appellants, and urges that the decision of the Court of Appeals be reversed. Requests for consent by the parties to the filing of this brief were granted by appellants but denied by appellee.

The Association of American Railroads is an unincorporated trade association whose members comprise almost all of the Nation's Class I railroads. These members are listed in the appendix to this motion. In addition to the Class I railroads, the Association represents the interests of several hundred smaller railroads, terminal companies, and switching lines. The Association's members operate 92 percent of the trackage, employ 94 percent of the workers, and generate 97 percent of the freight revenues of all railroads in the United States. Six Class I railroads conduct extensive operations over 6,966 miles of track in Iowa and employ 9,292 workers within the state. More to the point, a substantial portion of all of the Nation's railroads participate in the intercity freight shipments that originate in, pass through, or terminate in Iowa. Railroad operations compete directly with the operations of appellee Consolidated Freightways and other motor carriers in the freight transportation business around which this litigation revolves.

The Association represents its members in a wide variety of matters that are of concern to many or all of them, including matters that affect competition between railroads and motor carriers. State restrictions on truck lengths and other highway vehicle regulations are a concern to the Nation's railroads, not only because highway laws, limitations, and privileges directly affect competition between railroads and trucks but also because railroads and their employees are a part of the motoring public. Railroads have always borne and will continue to bear the tremendous costs of constructing, owning, and maintaining rail rights-of-way and track structures. Appellee and all other motor carriers, however, operate over highways constructed, owned, and maintained by the States. The competitive advantage thus conferred upon motor carriers by the Nation's highway policies is substantial in terms of operating costs and ultimately the rate levels charged to shippers. The decision of the court below, if upheld, will magnify the competitive advantage of motor carriers and further cripple the ability of railroads to compete for intercity freight. And in view of the extensive record compiled below, the decision of the court below, if upheld, will raise a substantial doubt as to the defensibility of most, if not all, of the existing State truck length limitations.

As is more fully set forth in the attached *amicus curiae* brief, the Association supports the appeal of Raymond Kassels, *et al.* The decision below misconstrues this Court's recent decision in *Raymond Motor Trans. Inc.* v. *Rice*, 434 U.S. 429 (1978), and thereby departs from a long line of cases in which this Court has consistently affirmed the right of a State, in the absence of Federal legislation, to regulate the size and the weight of vehicles operated on public highways so long as State highway regulations do not discriminate against interstate commerce. Because the Association and its members believe the decision of the court below places in doubt the validity of all truck length restrictions in each of the States, the Association fears that abilitiy of railroads to retain and increase their share of the market for intercity freight transportation will be substantially impaired. This litigation, therefore, involves matters of compelling importance to the Association and its members.

The purpose of the attached *amicus curiae* brief is to explain the significance of this case to the railroad industry and to set forth the reasons why the decision of the court below should be reversed. The arguments presented in this attached brief are intended to supplement rather than duplicate the arguments advanced by appellants, Raymond Kassels, *et al.* Because appellants, as public officials, may be restrained from vigorously promoting the inherent advantages of rail transportation over competing modes of transportation, the Association believes its arguments will be helpful to this Court in its consideration of the appeal of Raymond Kassels, *et al.* For these reasons, the Association has filed this motion and respectfully urges that leave to file the attached *amicus curiae* brief be granted.

Harry J. Breithaupt, Jr.
David W. Donley

ASSOCIATION OF
AMERICAN
RAILROADS
1920 L Street, N.W.
Washington, D.C. 20036
(202) 293-2096

Attorneys for the Association of American Railroads

APPENDIX

Members of the Association of American Railroads

Akron, Canton & Youngstown Railroad Co.
Alton & Southern Railway Co.
Atchison, Topeka & Santa Fe Railway Co.
    Los Angeles Junction Railway
    Illinois Northern Railway
Atlanta & St. Andrews Bay Railway Co.
Baltimore & Ohio Railroad Co.
    Curtis Bay Railroad Co.
    Staten Island Railroad Corporation
Baltimore & Ohio Chicago Terminal Railroad Co.
Bangor & Aroostook Railroad Co.
    Van Buren Bridge Railroad
Belt Railway Company of Chicago
Bessemer & Lake Erie Railroad Co.
Boston & Maine Corporation
Buffalo Creek Railroad
Burlington Northern Incorporated
    Oregon Electric Railway
    Oregon Trunk Railway
    Walla Walla Valley Railway
Cambria & Indiana Railroad Co.
Canadian Pacific Limited
    Aroostook Valley Railroad
    Canadian Pacific Lines in Maine
    Canadian Pacific Lines in Vermont
Chesapeake & Ohio Railway Co.
    Covington & Cinn. Elev. Railroad & Transfer & Bridge Co.
Chicago & Eastern Illinois Railroad
    Chicago Heights Terminal Transfer Co.
Chicago & Illinois Midland Railway Co.
Chicago & North Western Transportation Co.
Chicago & Western Indiana Railroad Co.
Chicago, Milwaukee, St. Paul & Pacific Railroad
    Washington, Idaho & Montana Railway Co.

- Clinchfield Railroad Co.
- Colorado & Southern Railway Co.
- Consolidated Rail Corporation
- Delaware & Hudson Railway Co.
  - Greenwich & Johnsonville Railway Co.
- Denver & Rio Grande Western Railroad Co.
- Detroit & Mackinac Railway Co.
- Detroit & Toledo Shore Line Railroad Co.
- Duluth, Missabe & Iron Range Railway Co.
- Elgin, Joliet & Eastern Railway Co.
- Fort Worth & Denver Railway Co.
- Galveston, Houston & Henderson Railroad
- Georgia Railroad
- Grand Trunk Lines
  - Grand Trunk
    - Central Vermont Railway, Inc.
    - Duluth, Winnipeg & Pacific Railway
  - Canadian National Railways
    - Lines in Michigan
    - Lines in New England
    - Lines in New York
    - Lines in Vermont
    - Minnesota & Manitoba Railroad (Leased Line)
  - Detroit, Toledo & Ironton Railroad Co.
- Green Bay & Western Railroad Co.
- Houston Belt & Terminal Railway Co.
- Illinois Central Gulf Railroad
  - Chicago & Illinois Western Railroad Co.
  - Waterloo Railroad
- Kansas City Southern Railway Co.
  - Arkansas & Western Railway Co.
  - Fort Smith & Van Buren Railway Co.
  - Kansas & Missouri Railway & Terminal Co.
- Kentucky & Indiana Terminal Railroad
- Lake Superior & Ishpeming Railroad
- Louisiana & Arkansas Railway Co.
- Louisville & Nashville Railroad Co.
  - Carrollton Railroad Co.

McCloud River Railroad Co.
Maine Central Railroad Co.
    Portland Terminal Co.
Manufacturers Railway Co.
Minneapolis, Northfield & Southern Railway Co.
Missouri-Kansas-Texas Railroad Co.
    Beaver, Meade & Englewood Railroad Co.
Missouri Pacific Railroad Co.
    Doniphan, Kensett & Searcy Railway Co.
    New Orleans & Lower Coast Railroad Co.
    Brownville & Matamoras Bridge Terminal Co.
    St. Joseph Belt Railway
Missouri-Illinois Railroad Co.
Norfolk & Western Railway Co.
    Chesapeake Western Railway Co.
    Lorain & West Virgina Railroad Co.
    New Jersey, Indiana & Illinois Railroad Co.
    Norfolk, Franklin & Danville Railway Co.
    Lake Erie & Ft. Wayne Railroad Co.
Pittsburgh & Lake Erie Railroad Co.
Peoria & Pekin Union Railway Co.
Pittsburg & Shawmut Railroad Co.
Prescott & Northwestern Railroad Co.
Raritan River Railroad Co.
Richmond, Fredericksburg & Potomac Railroad Co.
St. Louis-San Francisco Railway Co.
    Quanah, Acme & Pacific Railway Co.
St. Louis Southwestern Railway
Seaboard Coast Line Railroad Co.
    Columbia, Newberry & Laurens Railroad Co.
    Gainesville Midland Railroad Co.
Soo Line Railroad Co.
    Sault Ste. Bridge Co.
Southern Pacific Transportation Co.
    Holton Interurban Railway Co.
    Northwestern Pacific Railroad Co.
    Petaluma & Santa Rosa Railroad Co.
    San Diego & Arizona Eastern Railway Co.
    Visalia Electric Railroad Co.

- Southern Railway Co.
    - Alabama Great Southern Railroad Co.
    - Louisiana & Southern Railway Co.
    - New Orleans Terminal Co.
    - Atlantic & Eastern Carolina Railway Co.
    - Camp Le Jeune Railroad Co.
    - Central of Georgia Railroad Co.
    - Cin., New Orleans & Texas Pacific Railway Co.
    - Georgia Northern Railway Co. (The)
    - Georgia Southern & Florida Railway Co.
    - Live Oak Perry & South Georgia Railroad
    - State University Railroad Co.
    - Interstate Railroad Co.
    - St. Johns River Terminal Co.
    - Tennessee, Alabama & Georgia Railway Co.
    - Tennessee Railway Co.
    - Norfolk Southern Railway
- Texas & Pacific Railway Co.
    - Abilene & Southern Railway Co.
    - Texas-New Mexico Railway Co.
    - Weatherfold, Mineral Wells & Northwestern Railway
- Texas Mexican Railway Co.
- Union Railroad (Pittsburgh)
- Union Pacific Railroad
    - Spokane International Railroad Co.
    - Mt. Hood Railway Co.
- Vermont Railway, Inc.
- Western Maryland Railway Co.
- Western Pacific Railroad Co.
    - Sacramento Northern Railway
    - Tidewater Southern Railway
- Western Railway of Alabama
    - Atlanta & West Point Railroad Co.
- Winston-Salem Southbound Railway

Associate Members

Alaska Railroad
Aliquippa & Southern Railroad Co.
American Refrigerator Transit Co.
Apalachicola Northern Railroad Co.
Belfast & Moosehead Lake Railroad Co.
Birmingham Southern Railroad Co.
Brooklyn Eastern District Terminal Railroad
California Western Railroad
Chestnut Ridge Railway Co.
Chicago Short Line Railway Co.
Chicago South Shore & South Bend Railroad
Chicago, West Pullman & Southern Railroad Co.
Cities Service Co. Railroad
Colorado & Wyoming Railway Co.
Cuyahoga Valley Railway Co.
Dardanelle & Russeville Railroad
Delray Connecting Railroad Co.
Duluth & Northeastern Railroad Co.
Durham & Southern Railway Co.
East Erie Commercial Railroad
East Jersey Railroad & Terminal Co.
Fruit Growers Express Co.
Genesee & Wyoming Railroad Co.
Grafton & Upton Railroad Co.
Graysonia, Nashville & Ashdown Railroad Co.
Great Western Railway Co.
Hartfold & Slocomb Railroad—SSI Rail Corp.
Hillsdale County Railroad Co. Inc.
Johnstown & Stoney Creek Railroad Co.
La Salle & Bureau County Railroad Co.
Lake Terminal Railroad Co.
Louisiana & North West Railroad Co.
McKeesport Connecting Railroad Co.
Manufacturers' Junction Railway Co.
Minnesota, Dakota & Western Railway Co.
Monogahela Connecting Railroad Co.

New Orleans Public Belt Railroad
New Orleans Union Passsenger Terminal
New York City Transit Authority
Newburgh & South Shore Railway Co.
Northhampton & Bath Railroad Co.
Pacific Fruit Express Co.
Pearl River Valley Railroad Co.
Port Authority of New York & New Jersey (The)
River Terminal Railway Co.
Roscoe, Snyder & Pacific Railway Co.
Sierra Railroad Co. (California)
Southern Indiana Railway, Inc.
Texas & Nothern Railway Co.
Upper Merion & Plymouth Railroad Co.
United States Railway Association
Washington Terminal Co.
Youngstown & Northern Railroad Co.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, ET AL., *Appellants*,

v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A Delaware Corporation, *Appellee*.

On Appeal from the United States Court of Appeals for the Eighth Circuit

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BRIEF OF THE ASSOCIATION OF AMERICAN RAILROADS AS *AMICUS CURIAE*

The Association of American Railroads as *amicus curiae* submits this brief in support of Raymond Kassel, *et al.*, Appellants. The Association of American Railroads urges this Court to reverse the decision of the United States Court of Ajppeals for the Eighth Circuit in *Consolidated Freightways Corporation of Delaware* v. *Kassel,* 612 F.2d 1064 (8 Cir. 1979).

OPINION BELOW

The opinion of the United States Court of Appeals for the Eighth Circuit is reported at 612 F.2d 1064 (8 Cir. 1979).

The opinion of the United States District Court for the Southern District of Iowa, is reported at 475 F.Supp. 544 (S.D. Iowa 1979).

STATEMENT OF THE CASE AND INTEREST OF THE *AMICUS CURIAE*

The State of Iowa has established and has enforced motor vehicle laws limiting the permisible length of trucks operating on the public highways in Iowa. These laws restrict most combinations of a truck-tractor and single trailer (semi-trailers) to 55 feet in total length. However, combinations of a truck-tractor and two trailers (double-bottoms) as well as semi-trailers designed to haul livestock, mobile homes, or highway and farm vehicles and implements may extend to a maximum of 60 feet in total length. Section 321.457, Code of Iowa (1979). Equipment carried on vehicle and implement carriers may extend three feet beyond the front or rear bumpers as long as the overall length of the load does not exceed 65 feet. Section 321.457(5), Code of Iowa (1979). As they pertain to double-bottoms, these length limits are in certain respects more restrictive than the limits adopted by a number of other states.

Consolidated Freightways Corporation of Delaware, the plaintiff in this litigation, has challenged the constitutionality of Iowa's truck length laws insofar as these laws limit double-bottom trucks to 60 feet. Consolidated Freightways would prefer to operate double-bottom trucks extending to 65 feet in length (so-called 65-foot twins), and thus, by way of this litigation seeks to enjoin the enforcement of Iowa's 60 foot length limitation against double-bottom trucks operating on the interstate highway in Iowa as well as on all other Iowa roads providing reasonable access between the interstate highways and facilities for food, fuel, repairs or rest. The effect of any injunction issued as a result of this litigation could, of course, reach far beyond the operations of Consolidated Freightways and would extend to all commodities and all trucking operations. Consolidated Freightways is among the Nation's largest common carriers of general commodities. Consolidated Freightways holds certificates of public convenience and necessity from the Interstate Commerce Commission and holds itself out to the public to be fit, willing, and able to perform those transportation services required by the public. Indeed, its operation extends to 46 states. Consolidated Freightways characterizes its operation as one in which the 65-foot twin has become the most common truck configuration, although other configurations, including the 60-foot twin and the 55-foot semi-trailer, are used. Trucking operations on Interstate 80, a major east-west route passing through Iowa, and on Interstate 35, a major north-south route passing through Iowa, are frustrated according to Consolidated Freightways because of the 60-foot length limit for double-bottoms operating in Iowa. Shipments must be either diverted around Iowa if moving in 65-foot twins, slowed while the 65-foot twins are broken down and individually moved across the state, or relegated to 55-foot semi-trailers and 60-foot double-bottoms. None of these alternatives is acceptable for the operations of Consolidated Freightways in the opinion of this company's management, and therefore, the motor carrier contends that the Iowa laws are an unjustified barrier to the free flow of commerce among the States.

Consolidated Freightways commenced this action in the district court below seeking a declaratory judgment and injunctive relief to restrain Iowa highway officials from enforcing the State's truck length limitations. The relief sought, and granted below, was directed to 65-foot double-bottoms operating on Iowa's interstate highways as well as other public roads in Iowa providing access to facilities for food, fuel, repairs, or rest. This relief of course would extend to any combination of 65-foot double-bottoms. Consolidated

Freightways to date has successfully argued that Iowa's 60-foot limit on double-bottoms constitutes an unjustified burden on interstate commerce. Consolidated Freightways has also argued that in providing certain exceptions to the general length limitations, Iowa's laws unconstitutionally discriminate against interstate commerce in favor of local interests.

The Motor Club of Iowa, an affiliate of the American Automobile Association, intervened in support of defendant highway officials below but did not appeal from the unfavorable order of the district court.

The district court, relying heavily upon this Court's recent decision in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978) and a perceived need to treat interstate highways apart from other public highways (J.S. App. 28a), granted the relief sought by Consolidated Freightways. The district court found that the record before it clearly suggested that 65-foot double-bottoms are as safe as, if not safer than, 60-foot double-bottoms, or 55-foot semi-trailers. (J.S. App. 21a.) The district court also found that the adjustments made by Consolidated Freightways in accomodating Iowa's truck length laws cause more miles to be traveled by 65-foot double-bottoms, thereby increasing the risk of accidents, highway wear, and fuel consumption. Upon these findings, the district court proceeded to what it variously termed a "balancing," a "sensitive consideration," and a "delicate adjustment" of the conflicting local and national interests. It held that the total effect of the safety measures did not outweigh the burdens on interstate commerce and declared, therefore, that Iowa's restriction on truck lengths amount to an unconstitutional burden on interstate commerce. The district court also analyzed the exceptions to the 55-foot and the 60-foot restrictions in view of Consolidated Freightway's contention that these exceptions discriminated against interstate commerce, but the court concluded that no undue discrimination existed.

The Court of Appeals for the Eighth Circuit affirmed the decision of the district court again relying upon this Court's decision in *Raymond*. According to the Eighth Circuit, the case at hand cannot be meaningfully distinguished from the *Raymond* case, and therefore, this Court's prior holding in *Raymond* is controlling. In so holding, the Eighth Circuit rejected Iowa's argument that a reviewing court properly cannot substitute its judgment for that of the State legislature on substantive questions of public safety. That court also rejected Iowa's argument that the State's effort to divert longer trucks from its public highways was a legitimate safety objective. The court characterizes such an effort an an "indirect" safety measure (J.S. App. 10a) and ruled that such measures must "automatically" give way to the national interests implicit in unrestricted interstate commerce. (*Id.*) In addition to rejecting these arguments put forward by Iowa, the court of appeals noted the existing exceptions to the 55-foot and 60-foot limitations and declared that such exceptions weaken the safety rationale put forward by the State.

The questions raised by Raymond Kassel, *et al.*, on this appeal are a matter of compelling interest to the Nation's railroads and to the Association of American Railroads. As set forth in its motion for leave to file, the Association of American Railroads is an unincorporated trade association whose membership includes almost all of the Class I railroads.[1] Its members operate 92 percent of the trackage, employ 94 percent of the workers, and generate 97 percent of the freight revenues of all railroads in the United States. The Association represents its members in a variety of matters that are of concern to many or all of them, including matters that affect the ability of railroads to compete with trucks. Six Class I railroads operate some 6,900 miles of track in Iowa.

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[1] As categorized by the Interstate Commerce Commission, Class I railroads are those roads having net annual revenues greater than $50 million. Of the 40 Class I railroads, only the Florida East Coast Railway and the Long Island Rail Road are not members of the Association.

Many other railroads participate in rail shipments that originate in, pass through, or terminate in Iowa. If not reversed, the decision of the courts below, by voiding the traditional role of State governments in establishing permissible truck size and weight limits, would promote the interests of the trucking industries in securing longer, heavier vehicles. Indeed, the district court below reluctantly noted that 108-foot triple-bottoms may be among the next innovations for the trucking industry. (J.S. App. 27a.) Longer, heavier trucks will affect directly the ability of railroads to maintain present traffic level as well as the ability to recapture traffic which through the years has moved from the rails to the highways.

The prospect of increased highway competition for intercity freight is a matter of particular concern to Association and its member railroads. Unlike our competitors who operate over highways constructed, owned, and maintained by the individual States, railroads generally have borne, and continue to bear, the tremendous costs of building and maintaining the roadbed, tracks, and signals essential for rail transportation. If the ability of State governments to limit truck sizes or weights is crippled, the unfair and shortsighted preferences enjoyed by motor carriers will be magnified. Railroads will find their ability to compete for intercity freight traffic eroded, while motor carriers will find themselves freed from the constraints of public safety regulation. The dismal financial posture of much of the railroad industry, as illustrated by the demise of the Rock Island and the bankruptcy of the Milwaukee Road (both beneficiaries of Iowa laws), is well known. The rate of return on net investment in 1979 was 2.68 percent for Class I railroads, an improvement over prior year's figure of 1.52 percent. The rate of return, however, has not been above 3 percent since 1966 nor above 4 percent since the mid-1950's. These returns must be contrasted with a rate of return of over 16 percent enjoyed by Class I motor common carriers in 1978, the latest figure available.[2] If these motor cariers can succeed in finagling their way past legitimate public safety concerns until the longest length limit becomes the norm, the railroad industry undoubtedly will suffer.

Many of the employees of the Association and of its member railroads travel on interstate highways in the course of their employment, and no doubt all of them do as ordinary citizens in the motoring public. Their safety and their convenience in using public highways is a matter of direct concern to them. The district court below recognized the direct impact an increase in truck traffic will have on the ordinary citizen (J.S. App. 23a.) This impact includes an increase in highway congestion, the likelihood of more severe accidents given the trend toward smaller cars, an increase in pavement deterioration, an increase in consumption of fuel supplies, higher automobile insurance premimums, and the need for additional highway patrolmen. (J.S. App. 23a.)

For these reasons, the Association of American Railroads and its member railroads regard the appeal of Raymond Kassel, *et al.*, as vitally important and are compelled to provide the Court with these views as to why the decision of the court below should be reversed. The Association believes these views will be helpful to the Court in reaching its decision.

SUMMARY OF ARGUMENT

The power of a State to regulate the size and weight of motor vehicles operated in interstate commerce over the public highways in that State was first considered and upheld by the Court in *Morris* v. *Duby,* 274 U.S. 135 (1927). Although the court recognized in that decision that Congress could preempt State authority by establishing supervening Federal legislation, Congress has through the years and continues today to refrain from enacting such supervening legislation. In the Surface Transportation Assistance Ace of 1978, Congress has specifically recognized the need for further study and investigation of the impact Federally mandated limitations might have. It is clear that Congress perceives no need for increased limits or for uniform provisions among the States, for recent legislation has rejected such increases and uniformity, notwithstanding the intensive pressures from the motor carrier industry.

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[2] 1979 Annual Report of the Interstate Commerce Commission, page 154.

The specific State restriction under scrutiny, a 60-foot overall length limitation for double-bottom tractor-trailer combinations, does not conflict with any Federal law. Neither does the process by which Iowa has established and enforced this restriction (as well as its other vehicle length restrictions) conflict with any prior decisions of this Court. The 60-foot restriction is a part of the comprehensive highway regulation scheme adopted by Iowa to promote public safety. The court below has erred in ruling to contrary. That court has held Iowa's highway laws to a standard of review which significantly departs from the prior decisions of this Court and which permits a reviewing court to substitute its judgment for that of the highway experts in the weighty substance of highway safety matters. In so doing, the court below has substantially intruded upon the long recognized role of State legislators and highway officials. The decision of the court below will require a State to document to the satisfaction of a reviewing court the specific safety concerns associated with any particular vehicle configuration or any vehicle length. Such a result would obliterate the strong presumption of constitutionality with which the courts have traditionally viewed public safety laws and would require that constitutional questions be resolved with scientific precision.

The court below has also erred in holding the impact of restrictive highway laws, that is, the inevitable diversion of longer, heavier trucks around the Iowa public highways, is entitiled to no weight in the safety equation. In so doing, the court below has departed even from the very test it states it is adopting. All evidence of public safety benefits to Iowa citizens should be weighed in determining the safety justification.

The Court's decision in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978) is not controlling in the present litigation because the issues now presented differ factually from those in *Raymond* and have reached the court on a substantially different record. This Court has previously recognized that substantive questions of highway safety are to be given a deference above most other public safety matters, for highway safety is peculiarly a local concern. The record in this case clearly demonstrates that the highway safety concerns shared by Iowa's highway officials are supported by substantive evidence and justification. These concerns are not illusory and, therefore, should not be evaluated under the tests employed by this Court where local concerns are illusory or do not rise to the special level of highway safety laws.

The burdens asserted by appellee in this litigation are not onerous, as appellee's own profitability clearly demonstrates. Rather, the burdens are largely attributable to appellee's business decision to purchase longer, heavier trucks. The alternatives available to motor carriers, *i.e.* smaller equipment, as well as the alternatives available to the Nation's freight shippers, *i.e.* railroads and other motor carriers operating 55-foot or 60-foot equipment in Iowa, clearly indicate that the burdens are not unreasonable.

For these reasons, the decision below should be reversed.

ARGUMENT

Iowa's 60-foot restriction on the length of double-bottom trucks is a rightful exercise of State powers to regulate highway traffic in the interest of public safety. The restriction does not conflict with any Federal law and does make a substantial contribution to public safety. The objections voiced by appellee in this litigation do not substantiate the contention that Iowa's truck length restrictions are an unreasonable burden on interstate commerce.

I. Iowa's restrictions on truck lengths are a rightful exercise of State powers to regulate highway traffic in the interest of public safety.

1. *The 60-foot limitation for double-bottom trucks does not conflict with any Federal law.*

In *Morris* v. *Duby,* 274 U.S. 135 (1927), this Court recognized that in the absence of preemptive measures by Congress a State retains its inherent powers to regulate vehicle sizes and weights, notwithstanding the Federal government's involvement in highway funding. In that 1927 decision this Court upheld an Oregon highway regulation which reduced the permissible weight limit for trucks operating in interstate commerce. The Court rejected the motor carrier arguments that restrictive measures taken by a State were constitutionally objectionable and declined to grant the injunctive relief sought by those motor carriers. Chief Justice Taft stated for the Court (*id.*, at 143) that:

> An examination of the acts of Congress discloses no provision, express or implied, by which there is withheld from the State its ordinary police power to conserve the highways in the interest of the public and to prescribe such reasonable regulations for their use as may be wise to prevent injury and damage to them. In the absence of national legislation especially covering the subject of interstate commerce, the State may rightly prescribe uniform regulations adopted to promote safety upon its highways and the conservation of their use, applicable alike to vehicles moving in interstate commerce and those of its own citizens.

Although the subjects of Federal highways and interstate motor carrier operations have been before the Congress upon a number of occasions since the basic rule was laid down by this Court in 1927, Congress has chosen on each occasion to leave the question of truck lengths to the states. The most recent decision of Congress to leave this matter to the States is reflected in the Motor Carrier Act of 1980.[3]

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[3] This legislation was signed by the President on July 1, 1980.

Although this Court has recognized in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978), (hereinafter *Raymond*), Congress' unwillingness to preempt vehicle length regulations (*id.*, at 422), the *Raymond* decision as well as the courts below in this litigation have not acknowledged Congress' concern over the public safety implications in removing State powers to regulate long and heavy trucks. Public safety has been, and remains, a principal concern of Congress. In the earliest Federal highway aid statutes, such as those underlying the motor carrier objections at issue in *Morris* v. *Duby, supra,*[4] Congress did not withhold from the States the power to limit the size or the weight of motor vehicles operating on public highways. Neither did Congress choose to deprive the States of the power to limit vehicle sizes or weights when it fashioned a comprehensive plan to regulate interstate motor carriers in the Motor Carrier Act of 1935.[5] This Court so held in *Maurer* v. *Hamilton*, 309 U.S. 598, 613 (1940). And again, in enacting the legislation which gave rise to the development of the interstate highway system as it generally exists today, the Federal-Aid Highway Act of 1956,[6] Congress purposefully left the matter of vehicle sizes and weights to the States.

When it enacted the 1956 Act, Congress expressed its concern "over the increase in weights and dimensions of vehicles operated over the highways of the United States," while "recogniz[ing] that the regulation of weights and dimensions should be handled by the States." S. Rept. No.

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[4] These statutes were "An Act to Provide that the United States shall aid the States in the construction of rural post roads, and for other purposes," C.241, 39 Stat. 355; Section 5 of "An Act Making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1920, and for other purposes," C.69, 40 Stat. 1189; and the Federal Highway Act of November 9, 1921, 42 Stat. 212.

[5] 49 Stat. 543. The Motor Carrier Act, as amended, is codified at 49 U.S.C. 10101 *et seq.*

[6] 70 Stat. 374. The Federal-Aid Highway Act, as amended, is codified at 23 U.S.C. 101 *et seq.*

350, 84th Cong., 1st Sess. (1955), at 14. Thus, the bill reported by the Senate Committee on Public Works "prohibit[ed] apportionment of funds authorized for the National System of Interstate Highways to any State in which such system may be used by vehicles with any dimension or weight in excess of the greater of (1) the maximum corresponding dimensions or weight permitted by" the existing State law or (2) "recommended" by a 1946 document issued by the American Association of State Highway Officials. *Id.*, at 23; see also, *id.*, at 14-15.

While the bill reported by the Senate Committee was passed by the Senate,[7] generally similar legislation was defeated in the House. See 101 Cong. Rec. 11717-11718 (1955). In the next session of Congress, the Senate Committee reported a similar bill, including the provision putting a ceiling upon the size and weight maximums which could be allowed by the States in order to be eligible for Federal funding. See S. Rept. No. 1965, 84th Cong., 2d Sess. (1956), at 13-14. The Committee noted, among other things, that the provision was "designed to restrain further increases in weights and dimensions of vehicles using the Interstate System." *Id.*, at 16. By then, the House and passed a generally similar bill which, however, provided for a ceiling upon the maximum per-axle weight only.[8]

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[7] See 101 Cong. Rec. 7033 (1955). In the Senate debates, Senator Gore (the sponsor of the bill) stated, among other things, that the "committee did not feel that the Federal Government should seek to invade the jurisdiction of States in the exercise of their police power by entering the field of regulating or enforcing provisions relative to the size and weight of vehicles," but "has for some time been disturbed by continued increases in the weights and dimensions of vehicles operated over highways constructed in part with Federal funds," and concluded that "some action to encourage the States to do a better job in this field is appropriate." *Id.*, at 6717.

[8] See 102 Cong. Rec. 7221-7222 (1956). See, also, H. Rept. No. 2022, 84th Cong., 2d Sess. (1956), at 10, which "recognizes that maximum weight limitations for vehicles using the highways are fundamentally a problem of State regulation," but noted some restriction on the maximum weight that a State could allow to be desirable.

On the floor of the Senate, Senator Kerr submitted an amendment in the form of a substitute for the provision in question, which he noted had been modified from its original form in a "series of discussions with" Senator Gore (the sponsor of and floor leader for the legislation) to add "certain limiting factors" so that "with these modifications he is willing to accept the amendment." 102 Cong. Rec. 9220,9221 (1956). The modified Kerr amendment went further than the House Bill in placing ceilings upon maximum allowable overall weight and width, as well as upon maximum allowable weight per axle, but eliminated the ceilings upon maximum length and height contained in the provision reported by the Senate Committee.

In regard to elimination of the ceiling upon maximum allowable length, Senator Kerr explained "that in some of the Western States licenses are issued for the addition of another trailer to a truck, where there are long stretches of open road and little congestion of traffic." *Id.*, at 9221. His amendment would not "interfere with that," but on the other hand: "It is thought in my mind and in the minds of those who agree that the limitations in this amendment will be adequate, because in those States where circumstances do not permit the longer vehicle, the State regulatory bodies have already established limits on the lengths of vehicles. This amendment does not interfere with that." *Id.*, at 9222. He did not believe that, "if longer trucks are permitted in certain States, there will be a movement in adjoining States to have longer trucks operate in those States," so that "we shall have longer trucks on highways," because "that situation exists now" in that "neighboring States have different regulations, but they live side by side in peace, without conflict." *Id.*, at 9223.

Senator Gore stated that: "I thought I should yield on the height. A saw no necessitv of yielding on the length. However, in order to reach a compromise with the Senator from Oklahoma [Mr. Kerr], realizing that axle placement and limitation would indirectly limit the length, and also believing that there was a total lack of uniformity as among the States, I agreed to that." *Id.*, at 9227. He further explained that: "What [the Kerr amendment] does not involve is the overall length, except indirectly. But when there is a limitation on both the per-axle weight and overall weight, practically speaking, there is a limitation on the vehicle, unless there is an additional unit drawn behind. I hope that my State will never permit it. I hope no other State which does not now permit it will in the future permit additional units to be drawn behind a tractor." *Id.* at 9224.

Both Senator Kerr and Senator Gore made clear that even with respect to maximum weight and width as to which ceilings would be established, the "amendment does not violate the integrity of a State which has limitations more exacting than those provided in the bill" (Senator Kerr), so that if "the State limitations were less, the provision would have no effect within that State" and the "State law would remain in effect" (Senator Gore). *Id.*, 9223, 9224. The Kerr admendment was adopted by the Senate (*id.*, at 9227), and was included unchanged in the bill reported by the Conference Committee[9] and enacted by the Congress. Hence, Section 108(j) of the Federal-Aid Highway Act of 1956 withheld Federal aid for the construction of Interstate highways from States in which the maximum allowable weight or width is "in excess of" amounts specificed in that statute or "by appropriate State authority in effect on July 1, 1956, whichever is the greater." 70 Stat. 381.

In 1974, the Congress amended that provision (88 Stat. 2283), as codified in 23 U.S.C. § 127, to permit "moderate increases" in the allowable weight maximums. S. Rept. No. 93-1111, 93d Cong., 2d Sess. (1974), at 10.[10] In recommending that legislation, the Senate Committee on Public Works stated that it "strongly believes that the ultimate decision on the weights of trucks is a matter for the States, and it wishes to stress that this legislation is now designed as a recommendation for State action." *Ibid.* "The Committee, in fact, rejected an Administration recommendation that the increases be mandatory on the States, for it is the States which have to determine for themselves—based on the needs of their own economies—the capacities of their road system to accomodate such changes and the costs that may result from the increases." *Ibid.* "Moreover, the Committee considered and rejected recommendations by the Administration and others to write into law for the first time a Federal guideline on the lengths of trucks. *The Committee believes that truck lengths should remain, as they have been, a matter for State decision.*" *Ibid.* (Emphasis added.) A factor in those determinations was "the question of safety," as "[h]eavier and larger trucks are said to overstress bridges, cause buffeting of smaller vehicles, and impose a psychological impact on other drivers." *Ibid.*

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[9] H. Rept. No. 2436, 84th Cong., 2d Sess. (1956), at 31-32.

[10] In the floor debates, Senator Bentsen explained that the increase in the allowable maximum weight was so limited in order "to make negligible the chances that trucks would have to be longer," and emphasized that: "In addition, the committee has left untouched the States' absolute power to regulate truck lengths. Truck lengths have never been written into Federal law, and the committee has no intention of changing that policy." 120 Cong. Rec. 30828 (1974).

In 1978 Congress again took up the subject of truck sizes and weights and the subject of uniform maximum provisions among the States. The resulting legislation, the Surface Transportation Assistance Act of 1978, 92 Stat. 2689, preserves in the States the power to set restrictions on trucks lengths. Section 161 of the legislation directs the Secretary of Transportation to study "the need for, and desirability of, uniformity in maximum truck size and weight limits throughout the United States."[11] This 1978 legislation clearly indicates that, in exercising its authority to provide for the free flow of traffic among the States and in developing the interstate highway system, Congress has not been persuaded of any need for absolute uniformity among State limitations on truck sizes or weights. Additionally, Congress recognized that any change in Federal policy should come only after the respective State highway officials have had an opportunity to make their case known to the Secretary of Transportation. Section 161 mandates that the study of truck size and weight limitations be "in cooperation with . . . the State departments of transportation or highway departments." In the absence of Congressional action pursuant to this study (the study results are not due until 1981), no basis exists for depriving a State of its traditional power to regulate vehicle sizes or weights.

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[11] 92 Stat. 2689, 2719. This study is only one of the numerous studies and investigations directed by the 1978 legislation in order to present Congress with a clearer understanding of vehicle sizes and weights and their impact on highways and highway users. See also Sections 211, 506, and 507. *Id.*, at 2734, 2760, 2761.

Most recently, Congress again declined to preempt State law in The Motor Carrier Reform Act of 1980. Congress has left to the States the matter of regulating truck sizes and weights, although the questions of uniformity and of a 65-foot standard were squarely before it. In passing the Motor Carrier Reform Act of 1980, Congress declared that "safe, sound, competitive, and fuel efficient is vital to the maintenenance of a strong National economy and a strong National defense" and "that the statutes governing Federal regulation of the Motor carrier industry are outdated and must be revised to reflect the transportation needs and realities of the 1980's." With these findings in mind, the House passed S. 2245 (after substituting the language of H.R. 6418 for the Senate version[12]) on June 19, 1980, after amending the bill to delete a provision which would preempt truck length limits.[13] See 126 Cong. Rec. 5339, 5414 (1980). The

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[12] The findings of the House Committee on Interstate and Foreign Commerce on H.R. 6418 are reported in House Report No. 96-1069, 96th Cong. 2nd Sess. (1980).

[13] Section 203 would have conditioned Federal funding upon a complicated scheme of Federal length limitations. A number of similar premptive measures have been introduced but have not gained support in the 96th Congress. For example, see H.R. 4505, H.R. 4245, H.R. 4545, and H.R. 4563.

Senate passed the House version of S. 2245 on June 20, 1980, concurring to House initiative to delete a preemptive truck length measure. See 126 Cong. Rec. 7684 (1980). The legislation, without provision for any higher uniform length limit, was signed into law on July 1, 1980.

While Congress clearly has the power to enact legislation establishing national standards regarding the weight and sizes of motor vehicles operating in interstate commerce, and thus to preempt inconsistent State regulations on that subject, it has been content to leave that matter to the States in accordance with the constitutional standards which this Court enunciated in *Morris* v. *Duby, supra,* and in the subsequent decisions of this Court. Congress has been concerned about the persistent pressures to increase permissible truck lengths or weights and has opted, at a minimum, to achieve a better understanding of the impact longer or heavier trucks might have.

2. *Iowa's restrictions upon truck length are consistent with the prior decisions of this Court.*

This Court has long held that, in the absence of discrimination against intrastate commerce, a State may restrict motor vehicle sizes and weights as a public safety measure. *Morris* v. *Duby, supra.* The rationale for this deference to State authority lies in the States "ordinary" police powers, powers which Congress has not seen fit to preempt. (*Id.*, at 143.) Beyond *Morris* v. *Duby*, this Court has upon a number of occasions reiterated the sanctity of the States' police powers to promote public safety and welfare. In *Sproles* v. *Binford*, 286 U.S. 374 (1932), this Court upheld a comprehensive scheme of State highway measures prescribing limits to the width, height, length, and weight of trucks and the lading which might move by truck in Texas. This statutory scheme also permitted a limited number of exceptions where shipments might be non-divisible or of limited duration. There, in response to challenges to the constitutionality of the States restrictions, the Court ruled that it was the legitimate role of the State of prevent wear and hazards due to excessive size of vehicles and weight of loads. And, this Court expressly noted that "scientific precision" was not to be expected in matters left to the "broad range of legislation discretion" and, indeed, that "scientific precision . . . . would subject the State to an intolerable supervision hostile to the basic principles of our government." *Id.*, at 388.

In *S.C. Hwy. Dept.* v. *Barnwell Bros.*, 303 U.S. 177 (1938), the Court again had occasion to review a challenge to truck size and weight restrictions adopted by a State. South Carolina established a far-reaching weight and width restriction which, in the aggrieved party's estimation, would have had the effect of prohibiting 85 to 90 percent of interstate trucks from using South Carolina's public highways. This Court upheld the constitutionality of this burdensome restriction, observing that "few subjects of state regulation are so peculiarly of local concern as is the use of state highways." (*Id.*, at 187.) The Court also noted that, notwithstanding the desirability and attractiveness of uniformity, of promoting national interests, and of curtailing State powers, it is not within judiciary's powers to look to standards which Congress might but has not adopted.

II. Iowa's restrictions on truck lengths make a substantial contribution to public safety.

L. *The incentives to move freight in and through Iowa in 55-foot semi-trailers or 60-foot double-bottoms promote highway safety.*

The courts below have noted that Iowa's truck length restrictions have resulted in a lighter traffic flow on public highways in Iowa than would otherwise occur if 65-foot double-bottoms would not have to operate around the State. Conversely, the traffic flow of 65-foot double-bottoms is alleged to be heavier in neighboring States. At least 75,000 additional truck trips would be made on Iowa highways if the 60-foot restriction were relaxed. (J.S. App. 92 and 23a.) The

Eighth Circuit has concluded, however, that this lighter traffic flow is not a cognizable safety claim and will automatically fail when contrasted with the competing national interest of free flowing interstate commerce. This holding conflicts with the previous decisions of this Court. It also must be contrasted with the Eighth Circuit's assertion that a reviewing court must look to the "total effect" of the challenged safety measure. In *Sproles* v. *Binford, supra,* this Court noted the State's concern over the increase in trucks used on Texas highways and upheld that State's efforts to promote the public welfare by limiting the number of larger, heavier trucks. The Court stated "this increase in 'truck density' justifies the dimensional and weight restrictions of the statute in the interest of public safety and convenience and highway protection." (*Id.*, at 385.) And again, in *S.C. Hwy. Dept.* v. *Barnwell Bros., supra.*, this Court highlighted the special local concern implicit in highway safety regulation and stated, "Few subject of state regulation are so peculiarly of local concern as is the use of state highways. There are few, local regulations of which is so inseparable from a substantial effect on interstate commerce . . . . The state has a primary and immediate concern in their safe and economical administration." (*Id.*, at 187.) Relying upon this "primary and immediate concern" of South Carolina, this Court declined to interfere with State's efforts to regulate truck sizes and weights even though the State's efforts would necessarily divert heavier, wider trucks from South Carolina highways onto the highways of neighboring States. Although the Eighth Circuit has erred in applying the *Raymond* decision in this case, as will be discussed later, it is quite clear, however, even *Raymond* does not limit the public safety benefits to be taken into account to so-called "direct" safety measures. No appropriate basis exists for the lower court's distinction between direct versus indirect safety objectives (See J.S. App. 9a and 10a). This objection to that distinction is particularly proper where alternative transportation exists, especially where the alternative of railroad operations and trailer-on-flat-car (piggyback) operations exist. In *Sproles* v. *Binford, supra,* at 394, the Court recognized the appropriate perspective, a perspective which the court below ignored. That perspective is as follows:

> The State has a vital interest in the appropriate utilization of the railroads which serve its people, as well as in the proper maintenance of its highways as safe and convenient facilities. The State provides its highways and pays for their upkeep. Its people make railroad transportation possible by the payment of transportation charges. It cannot be said that the State is powerless to protect its highways from being subjected to excessive burdens when other means of transportation are available. The use of highways for truck transportation has its manifest convenience, but we perceive no constitutional ground for denying to the State the right to foster a fair distribution of trafic to the end that all necessary facilities should be maintained and that the public should not be inconvenienced by inordinate uses of its highways for purposes of gain.

The courts below have been persuaded by appellee's allegations of undue burden. The record, however, makes clear that Consolidated Freightway's enjoys substantial profits from its intercity freight operations, that 55-foot semi-trailers and 60-foot double-bottoms are available and are used by Consolidated Freightways, and that, in addition to the operations of Consolidated Freightways, a substantial number of equally profitable competitors exist among the Class I motor common carriers. In view of this record in this case, the Eighth Circuit has erred by automatically excluding from its inquiry the public benefits from a reduced traffic flow as additional factors pertinent to the public safety issue.

Another obvious shortcoming of the decision below is that it places no boundary upon the factual expertise highway officials will necesarily be required to generate in the future. All vehicle length limitation are suspect once placed in issue by a motor carrier initiating litigation. This result arises form the Eighth Circuit's reading of this Court's decision in *Raymond, supra.* The Eighth Circuit would require a State to go forward and to demonstrate by the weight of evidence presented at trial that an asserted safety justification is substantive. (J.S. App. 7a) The application of the Eighth Circuit's requirement will mean that the vehicle length restrictions of each State are suspect because conclusive, documentary evidence may not be available or may not sufficiently refute the self-serving studies compiled by highway interests. Such a result was hardly intended by this Court in the *Raymond* decision. Rather, the Court noted with approval in that decision the well-established principle that a strong presumption of constitutionality attaches to State safety regulations. *(Id.*, at 443 and 444, citing *Bibb* v. *Navajo Freight Lines, 359 U.S. 520 (1959), Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970), and *Southern Pacific Co.* v. *Arizona,* 325 U.S. 761 (1945). This presumption does not survive the decision below.

The court below has asserted that its holding "in no way endorses a lowest common denominator approach" to highway safety. (J.S. App. 10a.) Given its construction of *Raymond,* however, it is indeed difficult to predict any different result. Under the Eighth Circuit's reading, a truck configuration or length operated in interstate commerce on the interstate highways of one or more States acquires a presumption of safety in the absence of documentary evidence or some conclusive expression of expertise to the contrary. Quite clearly in the opinion of the Association, this is not what the Court mandated in voiding the Wisconsin laws in *Raymond.* The Court has held that scientific detail and documentation are not required where a State's police powers are involved. In *Sproles* v. *Binford, supra,* the Court appropriately declared, "to make scientific precision a criterion of constitutional power would be to subject the State to an intolerable supervision hostile to the basic principles of our Government . . . ." (*Id.*, at 388.) In *S.C. Hwy. Dept.* v. *Barnwell Bros., supra,* the Court observed with regard to the factual matters in dispute that "scientific precision is not the criterion for the exercise of the constitutional regulatory power of the st ates." (*Id.*, at 195, citing *Sproles* v. *Binford, supra.*) The decision of the Eighth Circuit is contrary to these prior holdings of the

- McCloud River Railroad Co.
- Maine Central Railroad Co.
    - Portland Terminal Co.
- Manufacturers Railway Co.
- Minneapolis, Northfield & Southern Railway Co.
- Missouri-Kansas-Texas Railroad Co.
    - Beaver, Meade & Englewood Railroad Co.
- Missouri Pacific Railroad Co.
    - Doniphan, Kensett & Searcy Railway Co.
    - New Orleans & Lower Coast Railroad Co.
    - Brownville & Matamoras Bridge Terminal Co.
    - St. Joseph Belt Railway
- Missouri-Illinois Railroad Co.
- Norfolk & Western Railway Co.
    - Chesapeake Western Railway Co.
    - Lorain & West Virgina Railroad Co.
    - New Jersey, Indiana & Illinois Railroad Co.
    - Norfolk, Franklin & Danville Railway Co.
    - Lake Erie & Ft. Wayne Railroad Co.
- Pittsburgh & Lake Erie Railroad Co.
- Peoria & Pekin Union Railway Co.
- Pittsburg & Shawmut Railroad Co.
- Prescott & Northwestern Railroad Co.
- Raritan River Railroad Co.
- Richmond, Fredericksburg & Potomac Railroad Co.
- St. Louis-San Francisco Railway Co.
    - Quanah, Acme & Pacific Railway Co.
- St. Louis Southwestern Railway
- Seaboard Coast Line Railroad Co.
    - Columbia, Newberry & Laurens Railroad Co.
    - Gainesville Midland Railroad Co.
- Soo Line Railroad Co.
    - Sault Ste. Bridge Co.
- Southern Pacific Transportation Co.
    - Holton Interurban Railway Co.
    - Northwestern Pacific Railroad Co.
    - Petaluma & Santa Rosa Railroad Co.
    - San Diego & Arizona Eastern Railway Co.
    - Visalia Electric Railroad Co.

- Southern Railway Co.
  - Alabama Great Southern Railroad Co.
  - Louisiana & Southern Railway Co.
  - New Orleans Terminal Co.
  - Atlantic & Eastern Carolina Railway Co.
  - Camp Le Jeune Railroad Co.
  - Central of Georgia Railroad Co.
  - Cin., New Orleans & Texas Pacific Railway Co.
  - Georgia Northern Railway Co. (The)
  - Georgia Southern & Florida Railway Co.
  - Live Oak Perry & South Georgia Railroad
  - State University Railroad Co.
  - Interstate Railroad Co.
  - St. Johns River Terminal Co.
  - Tennessee, Alabama & Georgia Railway Co.
  - Tennessee Railway Co.
  - Norfolk Southern Railway
- Texas & Pacific Railway Co.
  - Abilene & Southern Railway Co.
  - Texas-New Mexico Railway Co.
  - Weatherfold, Mineral Wells & Northwestern Railway
- Texas Mexican Railway Co.
- Union Railroad (Pittsburgh)
- Union Pacific Railroad
  - Spokane International Railroad Co.
  - Mt. Hood Railway Co.
- Vermont Railway, Inc.
- Western Maryland Railway Co.
- Western Pacific Railroad Co.
  - Sacramento Northern Railway
  - Tidewater Southern Railway
- Western Railway of Alabama-
  - Atlanta & West Point Railroad Co.
- Winston-Salem Southbound Railway

Associate Members

Alaska Railroad
Aliquippa & Southern Railroad Co.
American Refrigerator Transit Co.
Apalachicola Northern Railroad Co.
Belfast & Moosehead Lake Railroad Co.
Birmingham Southern Railroad Co.
Brooklyn Eastern District Terminal Railroad
California Western Railroad
Chestnut Ridge Railway Co.
Chicago Short Line Railway Co.
Chicago South Shore & South Bend Railroad
Chicago, West Pullman & Southern Railroad Co.
Cities Service Co. Railroad
Colorado & Wyoming Railway Co.
Cuyahoga Valley Railway Co.
Dardanelle & Russeville Railroad
Delray Connecting Railroad Co.
Duluth & Northeastern Railroad Co.
Durham & Southern Railway Co.
East Erie Commercial Railroad
East Jersey Railroad & Terminal Co.
Fruit Growers Express Co.
Genesee & Wyoming Railroad Co.
Grafton & Upton Railroad Co.
Graysonia, Nashville & Ashdown Railroad Co.
Great Western Railway Co.
Hartfold & Slocomb Railroad—SSI Rail Corp.
Hillsdale County Railroad Co. Inc.
Johnstown & Stoney Creek Railroad Co.
La Salle & Bureau County Railroad Co.
Lake Terminal Railroad Co.
Louisiana & North West Railroad Co.
McKeesport Connecting Railroad Co.
Manufacturers' Junction Railway Co.
Minnesota, Dakota & Western Railway Co.
Monogahela Connecting Railroad Co.

New Orleans Public Belt Railroad
New Orleans Union Passsenger Terminal
New York City Transit Authority
Newburgh & South Shore Railway Co.
Northhampton & Bath Railroad Co.
Pacific Fruit Express Co.
Pearl River Valley Railroad Co.
Port Authority of New York & New Jersey (The)
River Terminal Railway Co.
Roscoe, Snyder & Pacific Railway Co.
Sierra Railroad Co. (California)
Southern Indiana Railway, Inc.
Texas & Nothern Railway Co.
Upper Merion & Plymouth Railroad Co.
United States Railway Association
Washington Terminal Co.
Youngstown & Northern Railroad Co.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, ET AL., *Appellants,*

v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A Delaware Corporation, *Appellee.*

On Appeal from the United States Court of Appeals for the Eighth Circuit

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BRIEF OF THE ASSOCIATION OF AMERICAN RAILROADS AS *AMICUS CURIAE*

The Association of American Railroads as *amicus curiae* submits this brief in support of Raymond Kassel, *et al.,* Appellants. The Association of American Railroads urges this Court to reverse the decision of the United States Court of Ajppeals for the Eighth Circuit in *Consolidated Freightways Corporation of Delaware* v. *Kassel,* 612 F.2d 1064 (8 Cir. 1979).

OPINION BELOW

The opinion of the United States Court of Appeals for the Eighth Circuit is reported at 612 F.2d 1064 (8 Cir. 1979).

The opinion of the United States District Court for the Southern District of Iowa, is reported at 475 F.Supp. 544 (S.D. Iowa 1979).

STATEMENT OF THE CASE AND INTEREST OF THE *AMICUS CURIAE*

The State of Iowa has established and has enforced motor vehicle laws limiting the permisible length of trucks operating on the public highways in Iowa. These laws restrict most combinations of a truck-tractor and single trailer (semi-trailers) to 55 feet in total length. However, combinations of a truck-tractor and two trailers (double-bottoms) as well as semi-trailers designed to haul livestock, mobile homes, or highway and farm vehicles and implements may extend to a maximum of 60 feet in total length. Section 321.457, Code of Iowa (1979). Equipment carried on vehicle and implement carriers may extend three feet beyond the front or rear bumpers as long as the overall length of the load does not exceed 65 feet. Section 321.457(5), Code of Iowa (1979). As they pertain to double-bottoms, these length limits are in certain respects more restrictive than the limits adopted by a number of other states.

Consolidated Freightways Corporation of Delaware, the plaintiff in this litigation, has challenged the constitutionality of Iowa's truck length laws insofar as these laws limit double-bottom trucks to 60 feet. Consolidated Freightways would prefer to operate double-bottom trucks extending to 65 feet in length (so-called 65-foot twins), and thus, by way of this litigation seeks to enjoin the enforcement of Iowa's 60 foot length limitation against double-bottom trucks operating on the interstate highway in Iowa as well as on all other Iowa roads providing reasonable access between the interstate highways and facilities for food, fuel, repairs or rest. The effect of any injunction issued as a result of this litigation could, of course, reach far beyond the operations of Consolidated Freightways and would extend to all commodities and all trucking operations. Consolidated Freightways is among the Nation's largest common carriers of general commodities. Consolidated Freightways holds certificates of public convenience and necessity from the Interstate Commerce Commission and holds itself out to the public to be fit, willing, and able to perform those transportation services required by the public. Indeed, its operation extends to 46 states. Consolidated Freightways characterizes its operation as one in which the 65-foot twin has become the most common truck configuration, although other configurations, including the 60-foot twin and the 55-foot semi-trailer, are used. Trucking operations on Interstate 80, a major east-west route passing through Iowa, and on Interstate 35, a major north-south route passing through Iowa, are frustrated according to Consolidated Freightways because of the 60-foot length limit for double-bottoms operating in Iowa. Shipments must be either diverted around Iowa if moving in 65-foot twins, slowed while the 65-foot twins are broken down and individually moved across the state, or relegated to 55-foot semi-trailers and 60-foot double-bottoms. None of these alternatives is acceptable for the operations of Consolidated Freightways in the opinion of this company's management, and therefore, the motor carrier contends that the Iowa laws are an unjustified barrier to the free flow of commerce among the States.

Consolidated Freightways commenced this action in the district court below seeking a declaratory judgment and injunctive relief to restrain Iowa highway officials from enforcing the State's truck length limitations. The relief sought, and granted below, was directed to 65-foot double-bottoms operating on Iowa's interstate highways as well as other public roads in Iowa providing access to facilities for food, fuel, repairs, or rest. This relief of course would extend to any combination of 65-foot double-bottoms. Consolidated

Freightways to date has successfully argued that Iowa's 60-foot limit on double-bottoms constitutes an unjustified burden on interstate commerce. Consolidated Freightways has also argued that in providing certain exceptions to the general length limitations, Iowa's laws unconstitutionally discriminate against interstate commerce in favor of local interests.

The Motor Club of Iowa, an affiliate of the American Automobile Association, intervened in support of defendant highway officials below but did not appeal from the unfavorable order of the district court.

The district court, relying heavily upon this Court's recent decision in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978) and a perceived need to treat interstate highways apart from other public highways (J.S. App. 28a), granted the relief sought by Consolidated Freightways. The district court found that the record before it clearly suggested that 65-foot double-bottoms are as safe as, if not safer than, 60-foot double-bottoms, or 55-foot semi-trailers. (J.S. App. 21a.) The district court also found that the adjustments made by Consolidated Freightways in accomodating Iowa's truck length laws cause more miles to be traveled by 65-foot double-bottoms, thereby increasing the risk of accidents, highway wear, and fuel consumption. Upon these findings, the district court proceeded to what it variously termed a "balancing," a "sensitive consideration," and a "delicate adjustment" of the conflicting local and national interests. It held that the total effect of the safety measures did not outweigh the burdens on interstate commerce and declared, therefore, that Iowa's restriction on truck lengths amount to an unconstitutional burden on interstate commerce. The district court also analyzed the exceptions to the 55-foot and the 60-foot restrictions in view of Consolidated Freightway's contention that these exceptions discriminated against interstate commerce, but the court concluded that no undue discrimination existed.

The Court of Appeals for the Eighth Circuit affirmed the decision of the district court again relying upon this Court's decision in *Raymond.* According to the Eighth Circuit, the case at hand cannot be meaningfully distinguished from the *Raymond* case, and therefore, this Court's prior holding in *Raymond* is controlling. In so holding, the Eighth Circuit rejected Iowa's argument that a reviewing court properly cannot substitute its judgment for that of the State legislature on substantive questions of public safety. That court also rejected Iowa's argument that the State's effort to divert longer trucks from its public highways was a legitimate safety objective. The court characterizes such an effort an an "indirect" safety measure (J.S. App. 10a) and ruled that such measures must "automatically" give way to the national interests implicit in unrestricted interstate commerce. (*Id.*) In addition to rejecting these arguments put forward by Iowa, the court of appeals noted the existing exceptions to the 55-foot and 60-foot limitations and declared that such exceptions weaken the safety rationale put forward by the State.

The questions raised by Raymond Kassel, *et al.*, on this appeal are a matter of compelling interest to the Nation's railroads and to the Association of American Railroads. As set forth in its motion for leave to file, the Association of American Railroads is an unincorporated trade association whose membership includes almost all of the Class I railroads.[1] Its members operate 92 percent of the trackage, employ 94 percent of the workers, and generate 97 percent of the freight revenues of all railroads in the United States. The Association represents its members in a variety of matters that are of concern to many or all of them, including matters that affect the ability of railroads to compete with trucks. Six Class I railroads operate some 6,900 miles of track in Iowa.

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[1] As categorized by the Interstate Commerce Commission, Class I railroads are those roads having net annual revenues greater than $50 million. Of the 40 Class I railroads, only the Florida East Coast Railway and the Long Island Rail Road are not members of the Association.

Many other railroads participate in rail shipments that originate in, pass through, or terminate in Iowa. If not reversed, the decision of the courts below, by voiding the traditional role of State governments in establishing permissible truck size and weight limits, would promote the interests of the trucking industries in securing longer, heavier vehicles. Indeed, the district court below reluctantly noted that 108-foot triple-bottoms may be among the next innovations for the trucking industry. (J.S. App. 27a.) Longer, heavier trucks will affect directly the ability of railroads to maintain present traffic level as well as the ability to recapture traffic which through the years has moved from the rails to the highways.

The prospect of increased highway competition for intercity freight is a matter of particular concern to Association and its member railroads. Unlike our competitors who operate over highways constructed, owned, and maintained by the individual States, railroads generally have borne, and continue to bear, the tremendous costs of building and maintaining the roadbed, tracks, and signals essential for rail transportation. If the ability of State governments to limit truck sizes or weights is crippled, the unfair and shortsighted preferences enjoyed by motor carriers will be magnified. Railroads will find their ability to compete for intercity freight traffic eroded, while motor carriers will find themselves freed from the constraints of public safety regulation. The dismal financial posture of much of the railroad industry, as illustrated by the demise of the Rock Island and the bankruptcy of the Milwaukee Road (both beneficiaries of Iowa laws), is well known. The rate of return on net investment in 1979 was 2.68 percent for Class I railroads, an improvement over prior year's figure of 1.52 percent. The rate of return, however, has not been above 3 percent since 1966 nor above 4 percent since the mid-1950's. These returns must be contrasted with a rate of return of over 16 percent enjoyed by Class I motor common carriers in 1978, the latest figure available.[2] If these motor cariers can succeed in finagling their way past legitimate public safety concerns until the longest length limit becomes the norm, the railroad industry undoubtedly will suffer.

Many of the employees of the Association and of its member railroads travel on interstate highways in the course of their employment, and no doubt all of them do as ordinary citizens in the motoring public. Their safety and their convenience in using public highways is a matter of direct concern to them. The district court below recognized the direct impact an increase in truck traffic will have on the ordinary citizen (J.S. App. 23a.) This impact includes an increase in highway congestion, the likelihood of more severe accidents given the trend toward smaller cars, an increase in pavement deterioration, an increase in consumption of fuel supplies, higher automobile insurance premimums, and the need for additional highway patrolmen. (J.S. App. 23a.)

For these reasons, the Association of American Railroads and its member railroads regard the appeal of Raymond Kassel, *et al.*, as vitally important and are compelled to provide the Court with these views as to why the decision of the court below should be reversed. The Association believes these views will be helpful to the Court in reaching its decision.

SUMMARY OF ARGUMENT

The power of a State to regulate the size and weight of motor vehicles operated in interstate commerce over the public highways in that State was first considered and upheld by the Court in *Morris* v. *Duby,* 274 U.S. 135 (1927). Although the court recognized in that decision that Congress could preempt State authority by establishing supervening Federal legislation, Congress has through the years and continues today to refrain from enacting such supervening legislation. In the Surface Transportation Assistance Ace of 1978, Congress has specifically recognized the need for further study and investigation of the impact Federally mandated limitations might have. It is clear that Congress perceives no need for increased limits or for uniform provisions among the States, for recent legislation has rejected such increases and uniformity, notwithstanding the intensive pressures from the motor carrier industry.

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[2] 1979 Annual Report of the Interstate Commerce Commission, page 154.

The specific State restriction under scrutiny, a 60-foot overall length limitation for double-bottom tractor-trailer combinations, does not conflict with any Federal law. Neither does the process by which Iowa has established and enforced this restriction (as well as its other vehicle length restrictions) conflict with any prior decisions of this Court. The 60-foot restriction is a part of the comprehensive highway regulation scheme adopted by Iowa to promote public safety. The court below has erred in ruling to contrary. That court has held Iowa's highway laws to a standard of review which significantly departs from the prior decisions of this Court and which permits a reviewing court to substitute its judgment for that of the highway experts in the weighty substance of highway safety matters. In so doing, the court below has substantially intruded upon the long recognized role of State legislators and highway officials. The decision of the court below will require a State to document to the satisfaction of a reviewing court the specific safety concerns associated with any particular vehicle configuration or any vehicle length. Such a result would obliterate the strong presumption of constitutionality with which the courts have traditionally viewed public safety laws and would require that constitutional questions be resolved with scientific precision.

The court below has also erred in holding the impact of restrictive highway laws, that is, the inevitable diversion of longer, heavier trucks around the Iowa public highways, is entitiled to no weight in the safety equation. In so doing, the court below has departed even from the very test it states it is adopting. All evidence of public safety benefits to Iowa citizens should be weighed in determining the safety justification.

The Court's decision in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978) is not controlling in the present litigation because the issues now presented differ factually from those in *Raymond* and have reached the court on a substantially different record. This Court has previously recognized that substantive questions of highway safety are to be given a deference above most other public safety matters, for highway safety is peculiarly a local concern. The record in this case clearly demonstrates that the highway safety concerns shared by Iowa's highway officials are supported by substantive evidence and justification. These concerns are not illusory and, therefore, should not be evaluated under the tests employed by this Court where local concerns are illusory or do not rise to the special level of highway safety laws.

The burdens asserted by appellee in this litigation are not onerous, as appellee's own profitability clearly demonstrates. Rather, the burdens are largely attributable to appellee's business decision to purchase longer, heavier trucks. The alternatives available to motor carriers, *i.e.* smaller equipment, as well as the alternatives available to the Nation's freight shippers, *i.e.* railroads and other motor carriers operating 55-foot or 60-foot equipment in Iowa, clearly indicate that the burdens are not unreasonable.

For these reasons, the decision below should be reversed.

ARGUMENT

Iowa's 60-foot restriction on the length of double-bottom trucks is a rightful exercise of State powers to regulate highway traffic in the interest of public safety. The restriction does not conflict with any Federal law and does make a substantial contribution to public safety. The objections voiced by appellee in this litigation do not substantiate the contention that Iowa's truck length restrictions are an unreasonable burden on interstate commerce.

I. Iowa's restrictions on truck lengths are a rightful exercise of State powers to regulate highway traffic in the interest of public safety.

1. *The 60-foot limitation for double-bottom trucks does not conflict with any Federal law.*

In *Morris* v. *Duby*, 274 U.S. 135 (1927), this Court recognized that in the absence of preemptive measures by Congress a State retains its inherent powers to regulate vehicle sizes and weights, notwithstanding the Federal government's involvement in highway funding. In that 1927 decision this Court upheld an Oregon highway regulation which reduced the permissible weight limit for trucks operating in interstate commerce. The Court rejected the motor carrier arguments that restrictive measures taken by a State were constitutionally objectionable and declined to grant the injunctive relief sought by those motor carriers. Chief Justice Taft stated for the Court (*id.*, at 143) that:

> An examination of the acts of Congress discloses no provision, express or implied, by which there is withheld from the State its ordinary police power to conserve the highways in the interest of the public and to prescribe such reasonable regulations for their use as may be wise to prevent injury and damage to them. In the absence of national legislation especially covering the subject of interstate commerce, the State may rightly prescribe uniform regulations adopted to promote safety upon its highways and the conservation of their use, applicable alike to vehicles moving in interstate commerce and those of its own citizens.

Although the subjects of Federal highways and interstate motor carrier operations have been before the Congress upon a number of occasions since the basic rule was laid down by this Court in 1927, Congress has chosen on each occasion to leave the question of truck lengths to the states. The most recent decision of Congress to leave this matter to the States is reflected in the Motor Carrier Act of 1980.[3]

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[3] This legislation was signed by the President on July 1, 1980.

Although this Court has recognized in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978), (hereinafter *Raymond*), Congress' unwillingness to preempt vehicle length regulations (*id.*, at 422), the *Raymond* decision as well as the courts below in this litigation have not acknowledged Congress' concern over the public safety implications in removing State powers to regulate long and heavy trucks. Public safety has been, and remains, a principal concern of Congress. In the earliest Federal highway aid statutes, such as those underlying the motor carrier objections at issue in *Morris* v. *Duby, supra,*[4] Congress did not withhold from the States the power to limit the size or the weight of motor vehicles operating on public highways. Neither did Congress choose to deprive the States of the power to limit vehicle sizes or weights when it fashioned a comprehensive plan to regulate interstate motor carriers in the Motor Carrier Act of 1935.[5] This Court so held in *Maurer* v. *Hamilton*, 309 U.S. 598, 613 (1940). And again, in enacting the legislation which gave rise to the development of the interstate highway system as it generally exists today, the Federal-Aid Highway Act of 1956,[6] Congress purposefully left the matter of vehicle sizes and weights to the States.

When it enacted the 1956 Act, Congress expressed its concern "over the increase in weights and dimensions of vehicles operated over the highways of the United States," while "recogniz[ing] that the regulation of weights and dimensions should be handled by the States." S. Rept. No.

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[4] These statutes were "An Act to Provide that the United States shall aid the States in the construction of rural post roads, and for other purposes," C.241, 39 Stat. 355; Section 5 of "An Act Making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1920, and for other purposes," C.69, 40 Stat. 1189; and the Federal Highway Act of November 9, 1921, 42 Stat. 212.

[5] 49 Stat. 543. The Motor Carrier Act, as amended, is codified at 49 U.S.C. 10101 *et seq.*

[6] 70 Stat. 374. The Federal-Aid Highway Act, as amended, is codified at 23 U.S.C. 101 *et seq.*

350, 84th Cong., 1st Sess. (1955), at 14. Thus, the bill reported by the Senate Committee on Public Works "prohibit[ed] apportionment of funds authorized for the National System of Interstate Highways to any State in which such system may be used by vehicles with any dimension or weight in excess of the greater of (1) the maximum corresponding dimensions or weight permitted by" the existing State law or (2) "recommended" by a 1946 document issued by the American Association of State Highway Officials. *Id.*, at 23; see also, *id.*, at 14-15.

While the bill reported by the Senate Committee was passed by the Senate,[7] generally similar legislation was defeated in the House. See 101 Cong. Rec. 11717-11718 (1955). In the next session of Congress, the Senate Committee reported a similar bill, including the provision putting a ceiling upon the size and weight maximums which could be allowed by the States in order to be eligible for Federal funding. See S. Rept. No. 1965, 84th Cong., 2d Sess. (1956), at 13-14. The Committee noted, among other things, that the provision was "designed to restrain further increases in weights and dimensions of vehicles using the Interstate System." *Id.*, at 16. By then, the House and passed a generally similar bill which, however, provided for a ceiling upon the maximum per-axle weight only.[8]

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[7] See 101 Cong. Rec. 7033 (1955). In the Senate debates, Senator Gore (the sponsor of the bill) stated, among other things, that the "committee did not feel that the Federal Government should seek to invade the jurisdiction of States in the exercise of their police power by entering the field of regulating or enforcing provisions relative to the size and weight of vehicles," but "has for some time been disturbed by continued increases in the weights and dimensions of vehicles operated over highways constructed in part with Federal funds," and concluded that "some action to encourage the States to do a better job in this field is appropriate." *Id.*, at 6717.

[8] See 102 Cong. Rec. 7221-7222 (1956). See, also, H. Rept. No. 2022, 84th Cong., 2d Sess. (1956), at 10, which "recognizes that maximum weight limitations for vehicles using the highways are fundamentally a problem of State regulation," but noted some restriction on the maximum weight that a State could allow to be desirable.

On the floor of the Senate, Senator Kerr submitted an amendment in the form of a substitute for the provision in question, which he noted had been modified from its original form in a "series of discussions with" Senator Gore (the sponsor of and floor leader for the legislation) to add "certain limiting factors" so that "with these modifications he is willing to accept the amendment." 102 Cong. Rec. 9220,9221 (1956). The modified Kerr amendment went further than the House Bill in placing ceilings upon maximum allowable overall weight and width, as well as upon maximum allowable weight per axle, but eliminated the ceilings upon maximum length and height contained in the provision reported by the Senate Committee.

In regard to elimination of the ceiling upon maximum allowable length, Senator Kerr explained "that in some of the Western States licenses are issued for the addition of another trailer to a truck, where there are long stretches of open road and little congestion of traffic." *Id.*, at 9221. His amendment would not "interfere with that," but on the other hand: "It is thought in my mind and in the minds of those who agree that the limitations in this amendment will be adequate, because in those States where circumstances do not permit the longer vehicle, the State regulatory bodies have already established limits on the lengths of vehicles. This amendment does not interfere with that." *Id.*, at 9222. He did not believe that, "if longer trucks are permitted in certain States, there will be a movement in adjoining States to have longer trucks operate in those States," so that "we shall have longer trucks on highways," because "that situation exists now" in that "neighboring States have different regulations, but they live side by side in peace, without conflict." *Id.*, at 9223.

Senator Gore stated that: "I thought I should yield on the height. A saw no necessity of yielding on the length. However, in order to reach a compromise with the Senator from Oklahoma [Mr. Kerr], realizing that axle placement and limitation would indirectly limit the length, and also believing that there was a total lack of uniformity as among the States, I agreed to that." *Id.*, at 9227. He further explained that: "What [the Kerr amendment] does not involve is the overall length, except indirectly. But when there is a limitation on both the per-axle weight and overall weight, practically speaking, there is a limitation on the vehicle, unless there is an additional unit drawn behind. I hope that my State will never permit it. I hope no other State which does not now permit it will in the future permit additional units to be drawn behind a tractor." *Id.* at 9224.

Both Senator Kerr and Senator Gore made clear that even with respect to maximum weight and width as to which ceilings would be established, the "amendment does not violate the integrity of a State which has limitations more exacting than those provided in the bill" (Senator Kerr), so that if "the State limitations were less, the provision would have no effect within that State" and the "State law would remain in effect" (Senator Gore). *Id.*, 9223, 9224. The Kerr admendment was adopted by the Senate (*id.*, at 9227), and was included unchanged in the bill reported by the Conference Committee[9] and enacted by the Congress. Hence, Section 108(j) of the Federal-Aid Highway Act of 1956 withheld Federal aid for the construction of Interstate highways from States in which the maximum allowable weight or width is "in excess of" amounts specificed in that statute or "by appropriate State authority in effect on July 1, 1956, whichever is the greater." 70 Stat. 381.

In 1974, the Congress amended that provision (88 Stat. 2283), as codified in 23 U.S.C. § 127, to permit "moderate increases" in the allowable weight maximums. S. Rept. No. 93-1111, 93d Cong., 2d Sess. (1974), at 10.[10] In recommending that legislation, the Senate Committee on Public Works stated that it "strongly believes that the ultimate decision on the weights of trucks is a matter for the States, and it wishes to stress that this legislation is now designed as a recommendation for State action." *Ibid.* "The Committee, in fact, rejected an Administration recommendation that the increases be mandatory on the States, for it is the States which have to determine for themselves—based on the needs of their own economies—the capacities of their road system to accomodate such changes and the costs that may result from the increases." *Ibid.* "Moreover, the Committee considered and rejected recommendations by the Administration and others to write into law for the first time a Federal guideline on the lengths of trucks. *The Committee believes that truck lengths should remain, as they have been, a matter for State decision.*" *Ibid.* (Emphasis added.) A factor in those determinations was "the question of safety," as "[h]eavier and larger trucks are said to overstress bridges, cause buffeting of smaller vehicles, and impose a psychological impact on other drivers." *Ibid.*

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[9] H. Rept. No. 2436, 84th Cong., 2d Sess. (1956), at 31-32.

[10] In the floor debates, Senator Bentsen explained that the increase in the allowable maximum weight was so limited in order "to make negligible the chances that trucks would have to be longer," and emphasized that: "In addition, the committee has left untouched the States' absolute power to regulate truck lengths. Truck lengths have never been written into Federal law, and the committee has no intention of changing that policy." 120 Cong. Rec. 30828 (1974).

In 1978 Congress again took up the subject of truck sizes and weights and the subject of uniform maximum provisions among the States. The resulting legislation, the Surface Transportation Assistance Act of 1978, 92 Stat. 2689, preserves in the States the power to set restrictions on trucks lengths. Section 161 of the legislation directs the Secretary of Transportation to study "the need for, and desirability of, uniformity in maximum truck size and weight limits throughout the United States."[11] This 1978 legislation clearly indicates that, in exercising its authority to provide for the free flow of traffic among the States and in developing the interstate highway system, Congress has not been persuaded of any need for absolute uniformity among State limitations on truck sizes or weights. Additionally, Congress recognized that any change in Federal policy should come only after the respective State highway officials have had an opportunity to make their case known to the Secretary of Transportation. Section 161 mandates that the study of truck size and weight limitations be "in cooperation with . . . the State departments of transportation or highway departments." In the absence of Congressional action pursuant to this study (the study results are not due until 1981), no basis exists for depriving a State of its traditional power to regulate vehicle sizes or weights.

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[11] 92 Stat. 2689, 2719. This study is only one of the numerous studies and investigations directed by the 1978 legislation in order to present Congress with a clearer understanding of vehicle sizes and weights and their impact on highways and highway users. See also Sections 211, 506, and 507. *Id.*, at 2734, 2760, 2761.

Most recently, Congress again declined to preempt State law in The Motor Carrier Reform Act of 1980. Congress has left to the States the matter of regulating truck sizes and weights, although the questions of uniformity and of a 65-foot standard were squarely before it. In passing the Motor Carrier Reform Act of 1980, Congress declared that "safe, sound, competitive, and fuel efficient is vital to the maintenenance of a strong National economy and a strong National defense" and "that the statutes governing Federal regulation of the Motor carrier industry are outdated and must be revised to reflect the transportation needs and realities of the 1980's." With these findings in mind, the House passed S. 2245 (after substituting the language of H.R. 6418 for the Senate version[12]) on June 19, 1980, after amending the bill to delete a provision which would preempt truck length limits.[13] See 126 Cong. Rec. 5339, 5414 (1980). The

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[12] The findings of the House Committee on Interstate and Foreign Commerce on H.R. 6418 are reported in House Report No. 96-1069, 96th Cong. 2nd Sess. (1980).

[13] Section 203 would have conditioned Federal funding upon a complicated scheme of Federal length limitations. A number of similar premptive measures have been introduced but have not gained support in the 96th Congress. For example, see H.R. 4505, H.R. 4245, H.R. 4545, and H.R. 4563.

Senate passed the House version of S. 2245 on June 20, 1980, concurring to House initiative to delete a preemptive truck length measure. See 126 Cong. Rec. 7684 (1980). The legislation, without provision for any higher uniform length limit, was signed into law on July 1, 1980.

While Congress clearly has the power to enact legislation establishing national standards regarding the weight and sizes of motor vehicles operating in interstate commerce, and thus to preempt inconsistent State regulations on that subject, it has been content to leave that matter to the States in accordance with the constitutional standards which this Court enunciated in *Morris* v. *Duby, supra,* and in the subsequent decisions of this Court. Congress has been concerned about the persistent pressures to increase permissible truck lengths or weights and has opted, at a minimum, to achieve a better understanding of the impact longer or heavier trucks might have.

2. *Iowa's restrictions upon truck length are consistent with the prior decisions of this Court.*

This Court has long held that, in the absence of discrimination against intrastate commerce, a State may restrict motor vehicle sizes and weights as a public safety measure. *Morris* v. *Duby, supra.* The rationale for this deference to State authority lies in the States "ordinary" police powers, powers which Congress has not seen fit to preempt. (*Id.*, at 143.) Beyond *Morris* v. *Duby*, this Court has upon a number of occasions reiterated the sanctity of the States' police powers to promote public safety and welfare. In *Sproles* v. *Binford*, 286 U.S. 374 (1932), this Court upheld a comprehensive scheme of State highway measures prescribing limits to the width, height, length, and weight of trucks and the lading which might move by truck in Texas. This statutory scheme also permitted a limited number of exceptions where shipments might be non-divisible or of limited duration. There, in response to challenges to the constitutionality of the States restrictions, the Court ruled that it was the legitimate role of the State of prevent wear and hazards due to excessive size of vehicles and weight of loads. And, this Court expressly noted that "scientific precision" was not to be expected in matters left to the "broad range of legislation discretion" and, indeed, that "scientific precision . . . . would subject the State to an intolerable supervision hostile to the basic principles of our government." *Id.*, at 388.

In *S.C. Hwy. Dept.* v. *Barnwell Bros.*, 303 U.S. 177 (1938), the Court again had occasion to review a challenge to truck size and weight restrictions adopted by a State. South Carolina established a far-reaching weight and width restriction which, in the aggrieved party's estimation, would have had the effect of prohibiting 85 to 90 percent of interstate trucks from using South Carolina's public highways. This Court upheld the constitutionality of this burdensome restriction, observing that "few subjects of state regulation are so peculiarly of local concern as is the use of state highways." (*Id.*, at 187.) The Court also noted that, notwithstanding the desirability and attractiveness of uniformity, of promoting national interests, and of curtailing State powers, it is not within judiciary's powers to look to standards which Congress might but has not adopted.

II. Iowa's restrictions on truck lengths make a substantial contribution to public safety.

L. *The incentives to move freight in and through Iowa in 55-foot semi-trailers or 60-foot double-bottoms promote highway safety.*

The courts below have noted that Iowa's truck length restrictions have resulted in a lighter traffic flow on public highways in Iowa than would otherwise occur if 65-foot double-bottoms would not have to operate around the State. Conversely, the traffic flow of 65-foot double-bottoms is alleged to be heavier in neighboring States. At least 75,000 additional truck trips would be made on Iowa highways if the 60-foot restriction were relaxed. (J.S. App. 92 and 23a.) The

Eighth Circuit has concluded, however, that this lighter traffic flow is not a cognizable safety claim and will automatically fail when contrasted with the competing national interest of free flowing interstate commerce. This holding conflicts with the previous decisions of this Court. It also must be contrasted with the Eighth Circuit's assertion that a reviewing court must look to the "total effect" of the challenged safety measure. In *Sproles* v. *Binford, supra,* this Court noted the State's concern over the increase in trucks used on Texas highways and upheld that State's efforts to promote the public welfare by limiting the number of larger, heavier trucks. The Court stated "this increase in 'truck density' justifies the dimensional and weight restrictions of the statute in the interest of public safety and convenience and highway protection." (*Id.*, at 385.) And again, in *S.C. Hwy. Dept.* v. *Barnwell Bros., supra.*, this Court highlighted the special local concern implicit in highway safety regulation and stated, "Few subject of state regulation are so peculiarly of local concern as is the use of state highways. There are few, local regulations of which is so inseparable from a substantial effect on interstate commerce .... The state has a primary and immediate concern in their safe and economical administration." (*Id.*, at 187.) Relying upon this "primary and immediate concern" of South Carolina, this Court declined to interfere with State's efforts to regulate truck sizes and weights even though the State's efforts would necessarily divert heavier, wider trucks from South Carolina highways onto the highways of neighboring States. Although the Eighth Circuit has erred in applying the *Raymond* decision in this case, as will be discussed later, it is quite clear, however, even *Raymond* does not limit the public safety benefits to be taken into account to so-called "direct" safety measures. No appropriate basis exists for the lower court's distinction between direct versus indirect safety objectives (See J.S. App. 9a and 10a). This objection to that distinction is particularly proper where alternative transportation exists, especially where the alternative of railroad operations and trailer-on-flat-car (piggyback) operations exist. In *Sproles* v. *Binford, supra,* at 394, the Court recognized the appropriate perspective, a perspective which the court below ignored. That perspective is as follows:

> The State has a vital interest in the appropriate utilization of the railroads which serve its people, as well as in the proper maintenance of its highways as safe and convenient facilities. The State provides its highways and pays for their upkeep. Its people make railroad transportation possible by the payment of transportation charges. It cannot be said that the State is powerless to protect its highways from being subjected to excessive burdens when other means of transportation are available. The use of highways for truck transportation has its manifest convenience, but we perceive no constitutional ground for denying to the State the right to foster a fair distribution of trafic to the end that all necessary facilities should be maintained and that the public should not be inconvenienced by inordinate uses of its highways for purposes of gain.

The courts below have been persuaded by appellee's allegations of undue burden. The record, however, makes clear that Consolidated Freightway's enjoys substantial profits from its intercity freight operations, that 55-foot semi-trailers and 60-foot double-bottoms are available and are used by Consolidated Freightways, and that, in addition to the operations of Consolidated Freightways, a substantial number of equally profitable competitors exist among the Class I motor common carriers. In view of this record in this case, the Eighth Circuit has erred by automatically excluding from its inquiry the public benefits from a reduced traffic flow as additional factors pertinent to the public safety issue.

Another obvious shortcoming of the decision below is that it places no boundary upon the factual expertise highway officials will necesarily be required to generate in the future. All vehicle length limitation are suspect once placed in issue by a motor carrier initiating litigation. This result arises form the Eighth Circuit's reading of this Court's decision in *Raymond, supra.* The Eighth Circuit would require a State to go forward and to demonstrate by the weight of evidence presented at trial that an asserted safety justification is substantive. (J.S. App. 7a) The application of the Eighth Circuit's requirement will mean that the vehicle length restrictions of each State are suspect because conclusive, documentary evidence may not be available or may not sufficiently refute the self-serving studies compiled by highway interests. Such a result was hardly intended by this Court in the *Raymond* decision. Rather, the Court noted with approval in that decision the well-established principle that a strong presumption of constitutionality attaches to State safety regulations. *(Id.*, at 443 and 444, citing *Bibb* v. *Navajo Freight Lines, 359 U.S. 520 (1959), Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970), and *Southern Pacific Co.* v. *Arizona,* 325 U.S. 761 (1945). This presumption does not survive the decision below.

The court below has asserted that its holding "in no way endorses a lowest common denominator approach" to highway safety. (J.S. App. 10a.) Given its construction of *Raymond,* however, it is indeed difficult to predict any different result. Under the Eighth Circuit's reading, a truck configuration or length operated in interstate commerce on the interstate highways of one or more States acquires a presumption of safety in the absence of documentary evidence or some conclusive expression of expertise to the contrary. Quite clearly in the opinion of the Association, this is not what the Court mandated in voiding the Wisconsin laws in *Raymond.* The Court has held that scientific detail and documentation are not required where a State's police powers are involved. In *Sproles* v. *Binford, supra,* the Court appropriately declared, "to make scientific precision a criterion of constitutional power would be to subject the State to an intolerable supervision hostile to the basic principles of our Government . . . ." (*Id.*, at 388.) In *S.C. Hwy. Dept.* v. *Barnwell Bros., supra,* the Court observed with regard to the factual matters in dispute that "scientific precision is not the criterion for the exercise of the constitutional regulatory power of the st ates." (*Id.*, at 195, citing *Sproles* v. *Binford, supra.*) The decision of the Eighth Circuit is contrary to these prior holdings of the court and is neither required by, nor consistent with, the court's decision in *Raymond, supra.*

In *Raymond,* the court stated that the question of legitimate highway safety regulations is reflected in the comparable tests set out in *Bibb, supra,* and *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970). (*Raymond, supra* at 443.) Neither of the cited decisions mandates the result reached by the Eighth Circuit. In *Bibb, supra,* the Court struck down on constitutional grounds an Illinois highway law that required trucks operating within the State to be equipped with so-called "contour" mudguards, a new device not common to motor carrier operations in general. In declining to recognize the mudguards as legitimate State safety measures, the Court characterized its decision as one of those cases "few in number"where highway safety regulation is unreasonable. *Bibb, supra* at 529. See also the opinion of Justice Blackman in *Raymond, supra* at 448. The nature of the asserted burden in Iowa is wholly different from that in *Bibb*. Unlike the situation in the 1959 decision, Iowa's 60-foot limitations is not a new or innovative device as was the "contour" mudguard; rather Iowa's truck lengths restrictions extend back to 1963, a time when the interstate highway system as it exists today was developing. Similarly distinct from the *Bibb* situation, the challenged Iowa length restrictions are part and parcel of a comprehensive scheme of highway vehicle restrictions. Although the motor carrier industry would seek to bring itself within the narrow holding in *Bibb* by isolating and challenging only one length limitation, in one State at a time, and only as that limitation as pertains to interstate highway operations, the broad effect of the motor carrier's challenge should be clearly recognized. The district court below has specifically noted the propensity of motor carriers to leapfrog their way past highway size and weight restrictions. (J.S. App. 27a.) Further, as distinct from *Bibb,* the burdens claimed by Consolidated Freightway are attributable largely to the internal corporate decision to invest 65-foot double-bottom equipment rather than 55-foot semi-trailer or 60-foot double-bottom equipment.

III. Iowa's restrictions on truck lengths do not unreasonably burden interstate commerce.

1. *The Court's decision in Raymond is not controlling.*

By its own admonition in *Raymond Motor Trans. Inc.* v. *Rice, supra,* the Court clearly indicated that its holding was not to be construed as a measure of the propriety of a 55-foot truck length limitation or of the truck configuration limitation of States other than Wisconsin, *id.*, at 447. The Court went to great lengths to note that its decision turned on the record before the Court and the State's default on the question of any safety justification.[14] The courts below have recognized that a vigorous defense on the question of safety justification has been presented by Iowa. (J.S. App. 5a and 20a.) Beyond this distinction, the Iowa restrictions as well as Iowa's administration of the highway regulations differ factually from those matters under scrutiny in *Raymond, supra.* Thus, in the case now pending, a facutally different question of public safety concern has reached the Court on a distinctly different record from that compiled in the *Raymond* litigation. In view of these distinctions, the appellee errs in urging the Court to apply the holding of *Raymond* to the challenged Iowa restrictions, and the courts below have erred in concluding that the matters presented in this case cannot be meaningfully distinguished from those presented in *Raymond.*

2. *Iowa's substantive concerns of highway safety far exceed the purported burdens upon commerce.*

This Court has long recognized that even in the absence of any Federal legislation, the Commerce Clause remains available to protect against unwarranted State intrusions into the legitimate ends of free commerce among the States. *Cooley* v. *Board of Wardens*, 12 How. 299 (1851), *Southern Pacific* v. *Arizona ex rel. Sullivan*, 325 U.S. 761 (1945). Further this Court has frequently recognized and characterized its role under the Commerce Clause as that of the final arbiter of the competing demands of State and National interests. (*Id.*, at 769.) In the absence of undue discrimination against interstate commerce, however, a party challenging a State regulation must demonstrate far more than merely an adverse effect on interstate commerce, particularly where matters of public safety are involved. *Bibb, supra, S.C. Hwy. Dept.* v. *Barnwell Bros., supra; Maurer* v. *Hamilton, supra, Sproles* v. *Binford, supra*. And among these matters of public safety, this Court has declared that in no field has the Court's deference to State regulation been greater than the field of highway safety. *Hendrick* v. *Maryland*, 235 U.S. 610 (1915); *Sproles* v. *Binford, supra; Maurer* v. *Hamilton, supra; Railway Express Agency, Inc.* v. *New York*, 336 U.S. 106 (1949). In its recent *Raymond* decision, the Court acknowledged this special deference to highway safety and recognized that highway regulations which do not discriminate against interstate commerce typically place their burdens upon the local commercial interests as well as national commercial interests and thus are subject to check by a State's own political processes. Additionally, the special deference is also justified by the State's primary responsibility for highway construction, maintenance, and policing and by the wide disparity in highway conditions from State to State. *Raymond, supra*, at 444.

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[14] In *Raymond Motor Trans. Inc.* v. *Rice, supra,* the Court observed that Wisconsin made no effort to contradict the motor carrier evidence on the question of safety (*id.*, at 437) nor the motor carrier allegations of disrupted trucking operations (*id.*, at 438), that Wisconsin virtually defaulted in its defense of the challenged regulations (*id.*, at 444), and that no evidence contradicted the contention of substantial burdens the movement of goods (*id.*, 445).

The Eighth Circuit has departed, however, from the traditional tests this court has employed in evaluating State highway safety regulations. The Eighth Circuit's reasoning is not justified by these traditional tests nor even by the decision in *Raymond*. Rather, the Eighth Circuit has engaged in second guessing the legislature, a practice this court has held to be inappropriate in highway safety matters. See *Sproles* v.

Binford, supra, and *S.C. Hwy. Dept.* v. *Barnwell Bros.* The proper role for the courts below should have been an inquiry limited to determining only whether the State regulation was evenhanded and whether the safety justification was substantive and not illusory. The result reached by the courts below departs from the prior decision of this Court.

Neither does the decision in *Pike* v. *Bruce Church, Inc., supra,* require the result reached by the Eighth Circuit. In *Pike* v. *Bruce Church, Inc.* the Court was presented with a challenge to Arizona's produce regulations which required that Arizona-grown cantaloupes be marketed in packaging conforming to the requirements of the Arizona Fruit and Vegetable Standardization Act. In adopting a test by which to evaluate the challenged regulation, the Court specifically stated that the questions before it did not involve State restrictions in the field of public safety where deference to the State authorities has long been recognized (*Id.,* at 143). Thus in *Pike* v. *Bruce Church, Inc.* the presumption of constitutionality which attaches to State regulation over matters not subject to Congressional action was not as strong as the presumption underlying highway safety matters.

To the same effect, a number of other decisions applying the balancing test set out in *Pike* v. *Bruce Church, Inc.,* have not presented questions where in the supporting record demonstrates substantial public safety concerns. In *Great A&P Tea Co.* v. *Cottrell,* 424 U.S. 366 (1976), the question before the court involved a Mississippi law conditioning the marketing of out-of-state milk and milk products upon reciprocity agreements by other States. The agreements were designed to assure that comparable marketing privileges were received by Mississippi milk producers and, as the court observed *(Id.,* at 375) did not protect milk quality standards. In *Hughes* v. *Alexandria Scrap Corp.,* 426 U.S. 794 (1976), the court was presented with a challenge to a Maryland law which interfered with the transfer and processing of abandoning automobile hulks by scrap iron dealers. Public safety was not at issue. And in *Hunt* v. *Washington Apple Advertising*

Comm'n., 432 U.S. 333 (1977), the court addressed constitutional objections asserted against a North Carolina law requiring that all apples marketed with the State, if graded, conform to applicable U.S. grading standards. While each of the regulations challenged in these cited decisions involved legitimate State concerns, none of the questions presented for the court involved safety considerations as fundamental as highway vehicle size or weight restrictions. The Court, therefore, should not look to these decisions to control its evaluation of Iowa's truck length restrictions.

If the Eighth Circuit's decision is upheld, the Court will have placed itself squarely in the business of monitoring State truck length limitations. Such a result is inconsistent with the traditional notion that precise length limitations are a matter for legislative not judicial determination where safety considerations exist. Indeed, the prior decisions of this Court in *S.C. Hwy. Dept.* v. *Barnwell Bros.* and in *Fireman* v. *Chicago, R.I.&.P.R. Co.*, 393 U.S. 794 (1968) require that as a policy matter such safety concerns be left to the State legislature, at least until the time Congress might act. If this Court should choose to depart from its prior decisions and to step into the business of setting permissible truck sizes or truck weights, the Association believes a proper result would be a reduction rather than an increase in permissible limits. However, given the complexity and inconclusiveness of the evidence compiled in this litigation on the question of safety and on the question of burdens upon commerce, it is clear that the legislature and not the judiciary is better equipped to establish permissible limitations.

CONCLUSION

For the reasons above, the decision of the Eighth Circuit should be reversed.

Respectfully submitted,

HARRY J. BREITHAUPT, JR.
DAVID W. DONLEY

ASSOCIATION OF AMERICAN
RAILROADS
1920 L Street, N.W.
Washington, D.C. 20036
(202) 293-4096

Attorneys for Association of American Railroads

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

No. 79-1320

RAYMOND KASSEL, ET AL., *Appellants,*

v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A Delaware Corporation, *Appellee.*

On Appeal from the United States Court of Appeals for the Eighth Circuit

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CERTIFICATE OF SERVICE

I hereby certify that the Motion for Leave to File a Brief *Amicus Curiae* and the Brief of the Association of American Railroads as *Amicus Curiae* have been served upon the parties by mailing three copies each, this 8th day of July, 1980, to their respective counsel, as follows:

Honorable Thomas J. Miller
Attorney General of Iowa
Hoover State Office Building
Des Moines, Iowa 50312
(Counsel for Appellants)

John H. Lederer, Esquire
121 South Pinckney Street
Madison, Wisconsin 53703
(Counsel for Appellee)

Harry J. Breithaupt, Jr.

Supreme Court, U.S.
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No. 79-1320

IN THE

SUPREME COURT OF THE UNITED STATES

October Term, 1979

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Appellants,

vs.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE, A DELAWARE CORPORATION,
Appellee.

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ON APPEAL FROM THE UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

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BRIEF OF THE CITY OF AUBURN, NEBRASKA AS AMICUS CURIAE

———o———

ALBERT G. FULLER
City Attorney
McKNIGHT, HAHN, HAHN & FULLER
Auburn, Nebraska 68305
(402) 274-4321
Attorneys for the City of Auburn, Nebraska

GANT PUBLISHING COMPANY, 1610 N Street, Lincoln, Nebraska 68508

ISSUES PRESENTED

1. Is Iowa's prohibition on 65-foot double bottoms a legitimate highway safety regulation to be accorded "a strong presumption of constitutionality" where Iowa's benefits accrue solely by the degradation of corresponding interests of other states?

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BRIEF OF THE CITY OF AUBURN, NEBRASKA AS AMICUS CURIAE

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The City of Auburn, Nebraska, as *amicus curiae*, submits this brief in support of Appellees. Auburn believes the decisions below should be affirmed.[f.n.]

OPINION BELOW

The opinion of the United States Court of Appeals for the Eighth Circuit is reported at 612 F. 2d 1064 (8 Cir. 1979).

The opinion of the United States District Court for the Southern District of Iowa, is reported at 475 F. Supp. 544 (S.D. Iowa 1979).

STATEMENT OF THE CASE AND INTEREST OF AMICUS CURIAE

The State of Iowa restricts most combinations of truck and single trailer (semi trailers) and combinations of truck tractor and two trailers (also known as double bottoms or twin trailers) to 60 feet in total length; § 321.457, Code of Iowa (1980). Prior to May of 1980, Iowa had limited semi trailers to 55 feet in total length, except those semi trailers hauling livestock, farm vehicles or implements. Auto, boat, and implement carriers in Iowa are permitted in overall length, including overhang, of 65 feet; § 321.457(5), Code of Iowa (1979).

Consolidated Freightways Corporation (hereinafter "CF") is a regular route common carrier of general commodities operating in 48 states. CF regularly uses

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[f.n.] City of Auburn is a political subdivision of the State of Nebraska within the meaning of Supreme Court Rule 36.4. In addition, all parties have consented to filing of this brief.

65-foot double bottoms in its interstate operation. The standard double bottoms used in interstate commerce are 65 feet long (A. 155-157). Although CF has operated some 60-foot double bottoms exclusively in Iowa, the trailers of the 60-foot double bottom are not standard and cannot, therefore, be interchanged (A. 600, 603, 276-277).

At trial, Consolidated Freightways submitted substantial evidence on the safety of 65-foot doubles, while Iowa argued the evidence on safety was inconclusive. The trial court concluded:

> "The evidence convincingly, if not overwhelmingly, establishes that the 65-foot twin is as safe as, if not safer than, the 60-foot twin and the 55-foot semi." *Consolidated Freightways v. Kassel*, 475 F. Supp. 544, 548 (1979).[1]

Iowa had also defended its ban by arguing that even if the 65-foot doubles were as safe as other vehicles, it had the prerogative to ban doubles in order to reduce traffic in the State of Iowa. The trial court held this to be a "legitimate local concern" but balanced it against the increase in traffic the ban caused elsewhere. The trial court found these local concerns to be "outweighed by the burden" the ban placed on interstate commerce. *Consolidated Freightways v. Kassel*, 475 F. Supp. at 551.

The Court of Appeals for the Eighth Circuit affirmed the trial court and specifically noted that Iowa's attempt to reduce traffic was an indirect safety measure and ruled that such a measure must "automatically" give way to the "countervailing safety interest in other states," when those countervailing interests were greater. *Consolidated Freightways v. Kassel*, 612 F. 2d 1064, 1069-1070 (1979).[2]

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[1] The District Court also found that on the type of highway predominent in Iowa, doubles caused less roadwear per vehicle than did semis. *Consolidated Freightways v. Kassel*, 475 F. Supp. at 554.

On appeal before this Court, the State of Iowa argues deference for its legislative judgment. It argues that this policy is founded on a safety judgment pertaining solely to the added length of 65-foot double bottoms — as opposed to their configuration. Iowa has also abandoned its argument that it may reduce highway traffic by diverting interstate traffic.[3]

Auburn's interest in the subject of this proceeding arose before the commencement of this lawsuit. The City of Auburn, population 3,650, is located in southeastern Nebraska, at the junction of U.S. Highway 136 and 73/75. Its location puts Auburn on the main diversion route used by 65-foot double bottoms shunted around Iowa as the result of the Iowa limits. By 1976, an estimated 177 doubles *per day* were passing through downtown Auburn solely as the result of Iowa length limitations (A. 84, 581). This large volume of heavy commercial vehicles has had a devastating effect on the main city streets of Auburn. The complete reconstruction of these streets is now necessary and will hopefully commence within the year.[4]

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[2] The Amicus brief of the Association of American Railroads suggests that the appellate court balanced Iowa's interest in reducing highway traffic against "the national interest implicit in unrestricted interstate commerce." (A.A.R. Brief, p. 5). Yet the context of the appellate court's discussion shows the court was balancing Iowa's interests against the adverse safety impact on other states, not the commercial interest of appellees.

[3] The AAR has reintroduced the diversion argument in its brief (AAR Brief, p. 18).

Since August, 1979, when the injunction was first entered by the District Court, there has been a marked reduction in double bottom and other truck traffic through Auburn. Presumably, these trucks are now crossing Iowa on Interstate 80 (A. 581).

As one might expect, large trucks still go through downtown Auburn, albeit at a much lower rate per day. It would obviously be desirable, in some respects, to eliminate all truck traffic through Auburn, but such trucks carry the nation's commerce and are a necessary part of our national economy. Auburn is willing to share its fair portion of the truck traffic for the general good of the country. Auburn's participation in these proceedings is merely to suggest that Iowa might do the same.

SUMMARY OF ARGUMENT

The nation's interests in promoting efficient, economical, and safe transportation must be considered when judging the validity of the interests an individual state advances on its own behalf when justifying a highway traffic regulation. Where a highway traffic regulation has an adverse impact outside of the state of its enactment, that adverse impact is part of the burden on interstate commerce. Here, that adverse impact includes additional accidents, road wear, fuel consumption, and economic inefficiencies. These burdens affect the citizens of Auburn, Nebraska.

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[4] See the testimony of Thomas D. Doyle, former Director-State Engineer for the Nebraska Highway Department (A. 84). Auburn also filed an affidavit, reproduced here as Appendix I, by our Mayor, John George attached to the Motion for Leave to File Brief Amicus Curiae before the 8th Circuit Court of Appeals.

In the case at hand, it is evident that 65-foot double bottoms are identified with interstate commerce rather than local carriage. The parochial vantage point of Iowa's elected officials render them unable to properly respond to this issue. As such, this court, and not Iowa elected officials, should act as the final arbitrator of the competing demands of state and national interests.

ARGUMENT

I.

The Iowa ban on 65-foot twin trailers thwarts national policy.

In 1941, Congress enacted the National Transportation Policy, which states in part:

> "It is hereby declared to be the national transportation policy of Congress . . . to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation. . . ." *National Transportation Policy Act of 1941*, § 722, Title I, § 1, 54 Stat. at 899.

The overall effect of Iowa's ban on 65-foot double bottoms is to undercut one national transportation policy. As the trial court concluded:

> ". . . Iowa's length restriction causes the trucks affected by the ban to travel more

> miles over more dangerous roads in other states which means a greater overall exposure to accidents and fatalities. More miles of highway are subject to wear, and more fuel is consumed, and greater transportation costs are incurred." *Consolidated Freightways v. Kassel*, 475 F. Supp. 544, 550 (1979).

These findings are literally undisputed. At the hearing on the Motion for Stay Pending Appeal, District Court Judge Stuart challenged counsel for the state to contradict any of the findings, if he could. The state's attorney was unable to do so:

> "THE COURT: I don't follow your safety argument at all when the record is clear, number one, that diversion causes vehicles to go more miles. More miles is a function of accidents.
>
> "The record is also clear that [I]nterstates are safer than two-lane highways. It makes it very clear that diversions result in more accidents, more fatalities, more consumption of fuel.
>
> "Now, I'm not in a position to tell all of the truckers that they must operate 55 foot semis. The safety argument, I just can't accept it, when you look at the overall safety. There are going to be more deaths, and there is going to be more fuel consumption.
>
> "Do you argue with that?
>
> "MR. PAFF: Your Honor, I know the point is that the diversion is caused — I think that our point of difference is basically what is bringing about the diversion of the traffic.
>
> "Missouri has a legislative process. Iowa has a legislative process. Illinois has a legislative process. It seems to me that what the Missouri legislature chooses to accept for its

> citizens — And there is absolutely no evidence in the record that increased — I agree with you that it is a function of miles, but it seems to me that what one state has chosen does not preclude Iowa, particularly —
>
> "THE COURT: Do you want me to reverse Raymond?
>
> "MR. PAFF: Well, that would help, Your Honor. We'll try.
>
> [Transcript, Hearing on Defendant's Motion for Stay Pending Appeal, p. 13-14].

It is not surprising that Iowa prefers to sidestep and ignore the factual issues. Even Iowa's own study which concluded that there was a net loss to *overall* highway safety from Iowa's unique length limit (A. 594).

The only tangible benefit Iowa can obtain from its ban on doubles is the reduction of its traffic volume. Reducing traffic volume thus reduces road wear and the potential exposure to accidents. Iowa is well aware that this reduction in traffic volume arises simply by diverting that traffic to circuitous bypass routes around Iowa, such as the one through Auburn (A. 175, 244-245, 581). The additional mileage caused by this indirect routing results in more highway deterioration and a greater exposure to accidents. These effects occur in the surrounding states and are incurred by the interstate traffic (A. 259). Thus, there is a direct burden on interstate commerce in terms of accidents, injuries, and highway wear.

The Interstate Highway System was designed to ASHTO [American Association of State Highway and Transportation Officials] specifications to support large commercial vehicles [Tr. Ex. 3]. The highways on the diversion routes, such as the cobblestone and asphalt portions through Auburn, do not necessarily meet the same high structural standards. Thus, the impact of the individual vehicles is greater on the diversion route due the lesser quality of roadway structures.

Moreover, the ability to move in interstate commerce is now more than ever tied to the availability of fuel. There is no disagreement on the fact that Iowa's refusal to permit 65-foot double bottoms forces large additional amounts of fuel to be consumed. The Iowa Department of Transportation estimated that 7 million gallons of fuel per year could be saved by eliminating the ban (A. 599). Thus, Iowa's ban runs counter to the spirit of both national transportation policy and national energy goals.

In evaluating the burden on interstate commerce, one must consider the effects Iowa's ban has on other states and other communities outside of Iowa. While Consolidated Freightways may feel an economic burden from the additional expense and disruption it suffers in its trucking business, it is the citizens of all states that pay for the unsafe, uneconomical, and inefficient service the Iowa ban fosters. In the balance, each of the benefits Iowa seeks to gain is outweighed by a corresponding detriment to the nation's interests.

II.

Iowa's elected officials have proven unable to properly weigh the nation's interests against their own.

Before this Court, Iowa claims that it bans 65-foot doubles solely because of their length. Yet, Iowa permits 65-foot double bottoms in commercial zones surrounding border cities and permits 65-foot auto carriers throughout the state; § 321.47 Code of Iowa (1980).

In *South Carolina Highway Dept. v. Barnwell Bros., Inc.*, 303 U.S. 177 (1938), the court anticipated that unreasonable or discriminatory restrictions on interstate commerce would be avoided because such restrictions would apply equally to local carriage. The burden on local interests would provide the internal political impetus to remove any unreasonable restrictions. However, *Barnwell* also recognized that:

> "State regulations affecting interstate commerce, whose purpose or effect is to gain for those within the state an advantage at the expense of those without, or to burden those out of the state without any corresponding advantage to those within, have been thought to impinge upon the constitutional prohibition even though Congress has not acted. [Citations omitted.]
>
> "Underlying the stated rule has been the thought, often expressed in judicial opinion, that when the regulation is of such a character that its burden falls principally upon those without the state, legislative action is not likely to be subjected to those political restraints which are normally exerted on legislation where it affects adversely some interests within the state." [Citations omitted.] (*South Carolina v. Barnwell Bros, Inc.*, 303 U.S. pp. 184-185, note 2.)

Iowa has diminished this internal check and balance system by a series of exemptions that have allowed local interests to be free from the burdensome length limitations. These exemptions underwent the normal "strong presumption of validity" that attaches to state highway safety regulations; *Raymond Motor Transportation v. Rice*, 434 U.S. 429 (1978).

For example, transportation costs for automobiles, and presumably the ultimate sale price, have been reduced by allowing automobile transporters additional length per vehicle, Section 321.451(5), Code of Iowa, 1979. Thus, the Motor Club of Iowa is free to oppose any further truck length increases, if it so desires.

Pressure from truck trailer manufacturers is also eliminated since 65-foot double bottoms manufactured in Iowa can be moved in tandem out of the state, § 321 E.10, Code of Iowa (1979). Similarly, small companies and manufacturers in border cities have the benefit of prompt twin trailer service to the west and east as a result of the border cities exemption. § 321.457(7), Code of Iowa (1979) [A. 618]. Finally, Iowa's extensive agricultural exemptions are tailored to the needs of Iowa's agricultural economy and thus dissuade that political base from advocating any general length increases [A. 617-621].

The only persons who are still affected by the 65-foot double bottom ban are the interstate motor carriers who operate 65-foot doubles, and the citizens of Illinois, Missouri, Kansas and Nebraska, who feel the effects of the diverted traffic. Neither of these groups have sufficient political influence in the State of Iowa to effect further change. The political check and balance anticipated in *Barnwell* is undermined and the resulting analysis of Iowa's decision-makers is distorted.

The inordinate weight accorded to Iowa's local interests has been evident at each stage of Iowa's consideration of truck length limits. The 1975 Iowa study is organized in a fashion that compares Iowa's interests as opposed to the nation's interests [A. 580-601]. In that study Iowa's DOT did a comprehensive review of both the local and national benefits. In each instance local benefits tended to be nominal; although in the case of increased highway traffic, there was a local disadvantage. On the other hand, the Nation's benefits were substantial. Nonetheless, Iowa failed to legalize 65-foot doubles.

From the deposition and trial testimony of Iowa's Governor Ray, it is evident that this form of decision-making carried through to his veto of the 65-foot twin trailer legislation. Governor Ray clearly identified 65-foot doubles as benefiting solely interstate traffic and out-of-state interests (A. 176, 180). As such, he saw no reason for permitting them in Iowa:

> "Q. The conclusion of your veto message in 1974 was basically that sixty-five foot twin trailers were a greater advantage to interests outside the State of Iowa and would not have much benefit to the interests inside the State of Iowa. Is that a correct statement of that position?
>
> A. I view my job as one to protect the best interest of the people of my state, and in doing so, I have to take into consideration, I think, the safety, the well-being, and the convenience of the people that live here." [A. 185-186]

Governor Ray effectively responded to the limited interests of his constituency. In doing so, he ignored the interests of surrounding states and communities such as Auburn.

Iowa now asserts that its sole purpose in banning

65-foot doubles is to promote safety. It is clear from the Iowa study and Governor Ray's testimony that economic considerations were given at least equal stature in the decision-making process. In that process, the nation's economic and safety interests were not given their proper weight in the comparison with the local interests.

In *Southern Pacific Co. v. Arizona*, 325 U.S. 761 (1945), this Court recognized that there was an infinite variety of cases in which local regulations also operate to regulate the nation's commerce. When that occurs, a reconciliation of the conflicting claims of state and national power was necessary. As Justice Stone stated,

> "For a hundred years it has been accepted constitutional doctrine that the commerce clause, without the aid of Congressional legislation, thus affords some protection from state legislation inimical to the national commerce, and that in such cases, where Congress has not acted this Court, and not the state legislature, is under the commerce clause the final arbiter of the competing demands of state and national interests. [Citations omitted.]" *Southern Pacific Co. v. Arizona*, 325 U.S. 761, 769 (1945).

The State of Iowa asks this Court to give deference to its elected officials' decision to ban 65-foot doubles. Review of the decision-making process shows that Iowa is consciously attempting to retain a nominal local advantage at the substantial expense of its sister states. Auburn believes that this is not a legitimate state prerogative to be allowed deference in judging it against the burden on interstate commerce. Even if such deference were allowed, the burden on interstate commerce includes the greater adverse safety effect upon Iowa's sister states. As the appellate court concluded, in such an instance, the weighing of competing interests is "automatic," 612 F. 2d at 1069-1070.

CONCLUSION

Apart from the economic burden on Appellee, Iowa's ban creates a burden on interstate commerce through the degradation of overall highway traffic safety, undue road wear on the nation's highways, and wasteful use of this nation's limited fuel resources. The State of Iowa is unwilling to properly weigh and consider the interests of the nation and its sister states. In such an instance, it is appropriate that this Court arbitrate the competing state and national interests. As Justice Cardozo summed up:

> "The Constitution was framed under the dominion of a political philosophy far less parochial in range. It was framed under the theory that the peoples of the several states must sink or swim together, and that in the long run, prosperity and salvation are in union and not division." *Baldwin v. GAF Seelig, Inc.*, 294 U.S. 511, 523 (1935).

For these reasons, the City of Auburn urges that the decision of the 8th Circuit Court of Appeals be affirmed.

Respectfully submitted,

Albert G. Fuller
McKnight, Hahn, Hahn & Fuller
Auburn, Nebraska 68305
Attorneys for City of Auburn, Nebraska

APPENDIX I

AFFIDAVIT

STATE OF NEBRASKA)
) ss.
COUNTY OF NEMAHA)

John George, being first duly sworn on oath, deposes and says:

(1) He is the Mayor of Auburn, Nebraska, a second-class city pursuant to Nebraska Revised Statutes § 17-107.

(2) This affidavit is made to support the *amicus* brief of the City of Auburn in opposition to the requested stay of Appellants who represent the State of Iowa.

(3) Auburn, Nebraska has a population of approximately 3,650, and is located in the southeastern portion of Nebraska. (See attached map).

(4) U. S. Highways 136 and 73/75 intersect in the center of Auburn.

(5) Within the City limits of Auburn, U.S. 136 is known as Central Avenue, and U.S. 73/75 is known as "J" Street.

(6) The intersection of Central Avenue and "J" Street in downtown Auburn is a busy intersection and has the only stoplight in the City.

(7) Central Avenue and "J" Street, approaching their intersection, are two-lane roadways with angle parking on either side.

(8) The downtown streets of Auburn were originally cobblestone, but were given an asphalt overlay approximately ten years ago.

(9) The volume of heavy commercial vehicle traffic, mostly made up of double-bottom trucks diverting around the State of Iowa due to Iowa's length limits, have caused considerable damage to Central Avenue and "J" Street in Auburn.

(10) As the result of this large volume of truck traffic, it is anticipated that Central Avenue and "J" Street will need to be completely reconstructed within the next two years.

(11) During the pendency of such construction, detour routes will be necessary, but the City has been unable to find an adequate detour route to date to accommodate the volume of truck traffic now experienced.

(12) For the past years, Auburn, Nebraska, has had a considerable and growing number of double-bottom trucks traveling through its downtown area as a result of diversion operations caused by the Iowa statutes.

(13) During the period between the entry of the injunction and the temporary stay, the volume of truck traffic through Auburn declined markedly.

(14) The most direct geographic route between points in northern Illinois and points in Nebraska is not through Auburn, Nebraska, but across Interstate 80 in Iowa.

(15) The grant of the stay will have a tremendous adverse effect on Auburn, Nebraska in that it will result in substantial difficulties in locating a detour route during road repairs necessitated by the volume of truck traffic diverted around the State of Iowa and will further deteriorate the main downtown streets of Auburn.

(16) This additional and *unnecessary* truck traffic also exposes the residents of Auburn to an increased likelihood of accidents and injuries.

Dated this 27th day of August, 1979.

John George, Mayor
Auburn, Nebraska

Subscribed and sworn to before me this 29th day of August, 1979. My commission expires: July 22, 1980.

Eunice M. Bradley, Notary Public
State of Nebraska

IN THE

SUPREME COURT OF THE UNITED STATES

October Term, 1979

79-1320

RAYMOND KASSEL, ET AL.,
Appellants,

vs.

CONSOLIDATED FREIGHTWAYS CORPORATION
OF DELAWARE, A DELAWARE CORPORATION,
Appellee.

ON APPEAL FROM THE UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

CERTIFICATE OF SERVICE

I hereby certify that the Brief of the City of Auburn as *Amicus Curiae* has been served upon the parties by mailing three copies each this 13th day of August, 1980, to their respective counsel, as follows:

Honorable Thomas J. Miller
Attorney General of Iowa
Hoover State Office Building
Des Moines, Iowa 50312
(Counsel for Appellants)

John H. Lederer, Esquire
121 South Pinckney Street
Madison, Wisconsin 53703
(Counsel for Appellee)

Albert G. Fuller

Albert G. Fuller

Supreme Court, U.S.
FILED
JUL 5 1980
MICHAEL RODAK, JR., CLERK

IN THE

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OCTOBER TERM, 1980

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RAYMOND KASSEL, et al.,
Appellants

v.

CONSOLIDATED FREIGHTWAYS CORPORATION OF DELAWARE,
A Delaware Corporation
Appellee

On Appeal From The United States Court Of Appeals For The Eighth Circuit

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BRIEF OF THE COMMONWEALTH OF VIRGINIA AS AMICUS CURIAE

MARSHALL COLEMAN,
Attorney General of Virginia

WALTER A. MCFARLANE,
Deputy Attorney General

JOHN M. MCCARTHY
Assistant Attorney General

1101 East Broad Street
Supreme Court Building
Richmond, Virginia 23219

QUESTIONS PRESENTED

A. Is The Balancing Test Of *Pike** The Appropriate Standard Of Review For A Legitimate State Highway Safety Regulation Challenged Under The Dormant Commerce Clause?

B. Is The Special Deference Due A Legitimate State Highway Safety Regulation Diminished Because Of Its Application To A Portion Of The Interstate System?

C. In Dormant Commerce Clause Litigation, Should The Validity Of A Legitimate State Highway Regulation Rest Upon Whether There Existed Significant Evidence Upon Which The Legislature Could Have Rationally Made Its Choice?

D. Where The Legislative Process Is Continuing, Should The Court Intervene To Dictate A Result Under The Dormant Commerce Clause?

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* *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137 (1970).

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On Appeal From The United States Court Of Appeals For The Eighth Circuit

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BRIEF OF THE COMMONWEALTH OF VIRGINIA AS AMICUS CURIAE

INTERESTS OF THE AMICUS CURIAE

Though the Commonwealth is vitally concerned with the maintenance of safety upon the highways, and limits the actual length of any combination of vehicles to 55 feet (§ 46.1-330, Code of Virginia (1950), as amended), it is not these considerations alone that prompt her file this amicus brief. Rather Virginia's concern also arises because she believes the District Court below manifestly failed to give proper deference to a choice made by the Iowa legislature amidst discrete, conflicting safety considerations and, instead, determined the relative weight which it felt should have been properly assigned by the legislature to these competing safety considerations. Approval by this Court of the analyses employed by the District Court could well have grave consequences both for the concept of federalism generally and for the traditional deference that has been accorded state legislative choices in the area of highway safety when challenged under a dormant Commerce Clause.[1]

She is aware that apparent congressional inaction in an area where uniformity seems appropriate to some may prompt a more activist approach by the judiciary.[2] She suggests, however, that such cure in the long run could prove worse than the perceived malady, i.e., a judicial willingness to decide policy issues constitutionally delegated to Congress will more likely provoke less, rather than more, congressional responsiveness. The setting of size, configuration and weight limits for trucks is peculiarly a legislative function.

STATEMENT OF THE CASE

The Commonwealth of Virginia adopts the Appellant's statement of the case.

SUMMARY OF ARGUMENT

While the standard of review generally applicable to regulations challenged under the Commerce Clause is that balancing test set forth in *Pike* v. *Bruce Church, Inc.*,[3] that case itself recognized the more sensitive issue posed by state legislation in the field of safety. The Court has long recognized that balancing human safety against economic interests is preeminently a legislative task. Since the state litigant could not even make a "colorable showing" that the regulation challenged in *Raymond Motor Transp. Inc.* v. *Rice*[4] made a contribution to safety, there was no occasion to apply the principle of *Brotherhood of Loc. Firemen & Eng'r* v. *Chicago R. I. & Pac. R. R.*[5] Rather than representing a departure from established principles, *Raymond* was consistent with *Bibb* v. *Navajo Freight Lines, Inc.*[6] where the Court had earlier concluded that state-mandated contoured mud flaps were identical in their safety properties to conventional ones required elsewhere.

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[1] U.S. CONST. art. I, § 8, cl. 3.

[2] *Cf. Consolidated Freightways Corp. of Del.* v. *Kassel,* 475 F. Supp. 544, 552 (S.D. Iowa 1979) (calling for Congressional preemption of interstate trucking regulations).

Raymond recognized the sensitive consideration that arises in the review of state highway safety regulations. Despite this *caveat*, the District Court subjected the wisdom of the Iowa law to a *de novo* review and, though it acknowledged that the prohibited longer twins were less safe than the shorter semis in some salient respects,[7] found them to be "overall. . .as safe as a semi".[8] The District Court concluded upon this finding that the law's contribution to safety was so slight that it could not justify its interference with interestate commerce.[9]

While the District Court correctly noted that ninety percent of the funding of Interstate roads originates with Congress, and that Congress exercises a pervasive role in the standards of their construction and maintenance, these factors were neutral on the deference due the state legislation by the District Court. Though Congress has recognized that the Interstate System is intended to serve the needs of interstate commerce, it has also declared that "local needs" should be given "equal consideration."

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[3] 397 U.S. 137 (1970).

[4] 434 U.S. 429 (1978).

[5] 393 U.S. 129 (1968).

[6] 359 U.S. 520 (1959).

[7] *Consolidated Freightways Corp. of Del.* v. *Kassel*, 475 F. Supp. 544, 549 (S.D. Iowa 1979).

[8] *Id.* at 548.

[9] *Id.* at 549.

The special deference due state highway safety considerations rests upon three basic considerations identified by *Raymond* but not addressed by the courts below. These considerations, applicable to the regulation in issue, should have strengthened the presumption of the regulation's validity.

The presumption of validity enjoyed by state highway safety measures is demonstrably so strong that the cases striking them down have been "few in number." Because highways are locally built and maintained and the conditions governing their use vary greatly from one locality to another, the deference shown their safety regulations has been consistently greater than the deference shown corresponding state railroad regulations.

While the Iowa statutory scheme prohibits sixty-five foot (65′) twins and not their *less* stable sixty foot (60′) counterparts, it must be recalled that Iowa's statutory scheme exhibits a safety concern for both configuration and length. It cannot be questioned that the length of a vehicle bears some rational relationship to its safety. Since legalization of the sixty foot (60′) may be realistically viewed as representing a legislative compromise of opposing forces' interests, the force which desired, and benefited from, that compromise should not be permitted to advantage itself in litigation from its seeming inconsistency with the statute's remaining provisions. State laws should not be declared unconstitutional merely because their schemes of classification are imperfect and this is especially so when they are challenged under the dormant Commerce Clause. Although hindsight may inform one that the sixty foot

(60′) twin is, in its stability aspect, safer than its longer, prohibited counterpart, requiring scientific precision of state legislation would be to subject the legislative process to an intolerable judicial supervision at odds with the basic principles of our government.[10]

In the instant case, the District Court weighed in the judicial scales the conceded merits and demerits of the longer twins and rejected the regulation prohibiting them because in its view "the weight of the evidence presented in court appear-[ed] to favor a different standard." The District Court granted no recognition to the Iowa legislature's right of discretion to determine that certain dangerous proclivities of the longer twins were worthy of special concern.

The Court has never held that the proponent of a safety regulation must prove in court by a preponderance of the evidence that it advances safety. The test should be whether there existed significant evidence upon which the legislature could have rationally made its choice. *Raymond,* in contradistinction to the case at hand, represents a unique situation in that the regulation's proponents "virtually defaulted" in producing "even colorable" evidence that it advanced safety.

It would be inappropriate to employ a "weight of the evidence" test developed in Commerce Clause litigation generally when reviewing the validity of state highway safety regulations. The validity of these measures should not be utterly at the mercy of the impressive litigation resources of their often nationally well-organized opponents.

Since the legislative process here is a continuing one and may resolve this dispute, the Court should defer to that process.

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[10] *Sproles* v. *Binford,* 286 U.S. 374, 388 (1932).

ARGUMENT

I

Under the Dormant Commerce Clause, It Is Inappropriate To Balance Non-comparable, Safety Benefits And Economic Burdens; Absent Congressional Action, A Legitimate Highway Safety Regulation Must Be Upheld.

There is no doubt that the standard of review to be applied in commerce litigation *generally* is that enunciated by the Court in *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137, 142 (1970); *See Philadelphia* v. *New Jersey,* 437 U.S. 617, 624 (1978).[11] However, *Pike* itself set to one side the question of "state legislation in the field of safety where the propriety of local regulations has long been recognized." 397 U.S. at 143. *Pike* dealt with interstate shipment of cantaloupes, an appropriate item for balancing in an economic sense; here, however, it would be impossible for the Court "to say that financial losses should be balanced against the loss of lives and limbs of workers and people using the highways." *Brotherhood of Loc. F. & E.* v. *Chicago R. I. & P. R. Co.*, 393 U.S. 129, 140 (1968). That judgment involves a policy consideration for the legislature. *Id.* at 138.

The continuing relevance of *Brotherhood* was recognized in *Great Western United Corporation* v. *Kidwell,* 577 F.2d 1256 (5th Cir. 1978). In declaring Idaho's corporate takeover law unconstitutional under the Securities Exchange Act of 1934, the Fifth Circuit rejected appellant's Commerce Clause argument. Though *Brotherhood's* holdings were held not relevant in that case because an economic benefit and burden were being balanced under the *Pike* formulation, the Court observed: "*Pike* balancing is inappropriate when the benefit of state legislation and the burden on interstate commerce are noncomparable." *Id.* at 1282 n. 54.

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[11] The Fourth Circuit has described *Pike's* test as a three-pronged one: "We therefore must decide (1) whether the Virginia automobile franchise statute promotes a legitimate local purpose (2) whether it treats interstate and intrastate commerce evenhandedly, and (3) whether the burden imposed on interstate commerce appears excessive when balanced against the state's interest." ***American Motors Sales Corporation*** v. ***Division of Motor Vehicles,*** 592 F.2d 219, 222 (4th Cir.) *cert. den.*, ____ U.S. ____ , 100 S.Ct. 71 (1979).

While at first glance there seems to be a general significance in the omission of any discussion of *Brotherhood* in *Raymond Motor Trans. Inc.* v. *Rice,* 434 U.S. 429 (1978), the unique situation presented in *Raymond* made the *Brotherhood* approach inapposite. Since there was not "even a colorable showing" of a contribution to safety made by Wisconsin in *Raymond, Id.* at 448, there was no occasion to treat the legislation there in issue with the great deference demanded to be shown to state regulations governing highway safety. Thus the *Raymond* situation was properly analyzed, *not* as a case involving a state highway safety regulation, but rather as an *economic* case to which the test adopted by the unanimous Court in *Pike* was applicable.[12]

II

State Highway Safety Measures Are Entitled to Special Deference.

Raymond recognized the "sensitive consideration" that occurs in reviewing state highway regulations. 434 U.S. at 441. The District Court, however, applied a somewhat mechanical balancing test by means of which it tallied up the safety reasons both favoring and opposing the regulation, and, finding them in their aggregates in apparent equipoise ("safe as, if not safer than" 475 F. Supp. at 548), concluded that the regulation would at best make a slight contribution to safety which could not be balanced against its interference with interstate commerce. *Id.* at 549. The proper inquiry should have been whether all the salient safety considerations favored the longer trucks "so overwhelmingly" that a legislature, motivated by considerations of safety, could not have *rationally chosen* to prohibit them.[13] *See Raymond,* 434 U.S. at 447.

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[12] Even if the *Pike* balancing test were held applicable to the instant case, it would appear that the regulation should be upheld inasmuch as Iowa treats intra-state and out-of-state interests in an evenhanded manner. *Cf. Philadelphia* v. *New Jersey,* 437 U.S. at 626 (In holding New Jersey could not prohibit the importation of only that waste originating outside the State, the Court said, "And it may be assumed as well that New Jersey may pursue those ends by slowing the flow of *all* waste into the State's remaining landfills even though interstate commerce may be incidentally affected." *Id.*).

A. The Reasons For This Special Deference Are Present Here.

The special deference granted to state highway safety regulations rests upon three considerations: (1) where such regulations are not on their face discriminatory to interstate commerce, their burdens fall equally on in-state and out-of-state economic interests, thereby insuring that the state's political processes check burdensome regulations, (2) the states are primarily responsible for their highways and (3) highway conditions vary from state to state. *Id.* at 444 n. 18. The courts below did not address these three considerations, though their presence should have strengthened the presumption of validity enjoyed by the regulation in issue.

Likewise, *Bibb* v. *Navajo Freight Lines, Inc.,* 359 U.S. 520 (1959) correctly struck down an Illinois statute; since there was no showing of a genuine safety consideration, the regulation could not overcome the burdens which it placed on interstate commerce. "The contour mud flaps law burdened the flow of commerce through Illinois in 1959 just as the length and configuration regulations burden the flow through Wisconsin today. It was shown that neither the mud flaps nor the regulations contributed to highway safety." *Raymond,* 434 U.S. at 451 (J. Blackmun concurring). *Raymond* and *Bibb* thus stand for the sensible proposition that judicial scrutiny of *alleged* state highway safety regulations will be heightened when there is no legitimate showing of a safety consideration. The peculiarly local nature of highways, identified in *South Carolina Highway Department* v. *Barnwell Bros.,* 303 U.S. 177 (1938), was sufficient to distinguish the case of *Southern Pacific Co.* v. *Arizona,* 325 U.S. 761 (1945), where a state railroad regulation was struck down. The Court has traditionally accorded a greater deference to highway safety regulations. The Court in *Arizona* expressly recognized the continuing application of *Barnwell's* holding to highway safety legislation. 325 U.S. at 783.

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[13] In *South Carolina State Highway Department* v. *Barnwell Bros.,* 303 U.S. 177, 191-92 (1938), Justice Stone stated:

> Since the adoption of one weight or width regulation, rather than another, is a legislative not a judicial choice, its constitutionality is not to be determined by weighing in the judicial scales the merits of the legislative choice and rejecting it if the weight of evidence presented in court appears to favor a different standard . . . . Hence, in reviewing the present determination we examine the record, not to see whether the findings of the court below are supported by evidence, but to ascertain upon the whole record whether it is possible to say that the legislative choice is without *rational basis.* (Emphasis added).

B. The Special Deference Due State Highway Safety Regulations Should Not Be Diminished By Reason Of Congressional Involvement In The Interstate System.

An undue emphasis was given by the District Court to the fact that "[n]inety percent of the costs [of the Interstate System in Iowa] was financed by federal funds." 475 F. Supp. at 550. The fact that the Interstate System is involved should in no wise diminish the concern evidenced in *Barnwell,* 303 U.S. at 190, and in *Raymond,* 434 U.S. at 443, for the great deference due state regulations adopted to promote highway safety. Assuming, for argument's sake, that the Spending Clause[14] would permit Congress to require uniformity in the area of truck length and configuration, Congress has not chosen to require such uniformity. Further, by declaring that Interstate projects, along with other federal-aid highways, provide for a "federally assisted State program," Congress has implied that federal funding of the Interstate system should not furnish a reason for infringing upon traditional state prerogatives. 23 U.S.C. § 145.

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[14] U.S. CONST. art. I, § 8, cl. 1.

While the District Court correctly noted that the Interstate System is intended to serve the needs of interstate traffic, Congress has expressly noted that the system's intended function is not so limited by declaring that "local needs" should be given "equal consideration with the needs of interstate commerce." 23 U.S.C. §101(b).

The District Court's attendant observation, that the federal government plays a pervasive role in the design, construction, maintenance and regulation of interstate highways could well lend support to the validity of a congressional enactment in the field at issue. (The conceded presence of that pervasive role establishes that, in the case of the Interstate System, Congress will intervene when it feels such intervention is desirable.) Congress' otherwise pervasive role, however, lends no support whatever to federal judicial intervention in an area of state legislation in which Congress has chosen not to act.

III

The Standard of Review Employed By The District Court "Second-Guessed" The Legislature And Invaded Its Prerogative To Choose Amidst Competing Considerations.

The District Court found that, while longer twins have safety advantages, "they are more likely than semis to jackknife or upset" and that they can be successfully "backed only for a short distance." It concluded, however, that "[t]he negative characteristics are not such that they render the twins less safe than semis *overall.*" 475 F. Supp. at 549 (emphasis supplied). From these statements alone, it is apparent that the District Court invaded the prerogative of Iowa's legislative process to make a rational choice from among discrete, competing safety considerations.

In understanding that both the District Court and the Circuit Court[15] misread the proper standard of review, it is helpful to recall some long standing principles governing review of state highway safety regulations. There is a strong presumption of validity for state safety measures (*Bibb,* 359 U.S. at 524) and, if the safety justifications are not "illusory", courts will not sit to second-guess legislative judgment. *Raymond,* 434 U.S. at 449 (J. Blackmun concurring). That presumption is so strong that the cases are "few in number" which have struck down highway safety regulations as unconstitutionally burdensome. *See Bibb,* 359 U.S. at 529. Finally, highways traditionally have been recognized as a subject of peculiarly local concern. *See Barnwell,* 303 U.S. at 187. They are locally built and maintained and conditions relating to their use vary from locality to locality. *Id.*

The District Court's opinion finds that Iowa "has practically destroyed its argument that double trailers are an additional safety hazard by legalizing the 60 foot twin." 475 F. Supp. at 549. However, Iowa's statutes exhibit a safety concern over the *length* of vehicles as well as over their configuration.[16] That the length of a vehicle considered alone bears a relationship to its safety should require no citation. Every State in the Union imposes some limitations on vehicular length. While it may have been more consistent for the legislature to prohibit both the sixty-five foot (65') twin *and* its shorter counterpart, "viewed realistically" it may be presumed that the legalization of the sixty foot (60') twin is the "product of compromise" between those forces that wished to retain a general limit of fifty-five feet (55') and the trucking industry which, no doubt, desired an even longer limit. *See Raymond,* 434 U.S. at 447. There would appear to be some measure of injustice in permitting an interest group, having once achieved a measure of success through legislative compromise, to then use the very legislative embodiment of that compromise as a weapon to gain by litigation that which could not be won through the legislative process. *Cf. Greenhills Home Own. Corp.* v. *Village of Greenhills,* 5 Ohio St.2d 207, 215 N.E.2d 403, 408 *cert. den.* 335 U.S. 836 (1966) (party encouraging enactment of zoning ordinance and deriving benefit therefrom estopped from attacking validity thereof on constitutional grounds). Rewarding such a tack would stultify the very legislative process upon which the resolution of this general controversy must ultimately depend. Moreover, in a more sensitive area, the Court has held that where rationality is the test, a State "does not violate the [non-dormant] Equal Protection Clause merely because the classifications by its laws are imperfect." *Massachusetts Bd. of Retirement* v. *Murgia,* 427 U.S. 307 (1976), citing *Dandridge* v. *Williams,* 397 U.S. 471, 485 (1970). Surely no stricter scrutiny of classification should be applied to legislation challenged under the dormant Commerce Clause.

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[15] *Consolidated Freightways Corp. of Del.* v. *Kassel,* 612 F.2d 1064, 1070 (8th Cir. 1979).

[16] *See* Appendix, Iowa Code § 321.457.

Although it may be true that, in hindsight, the sixty-five foot (65′) twin is safer in its stability aspect than the sixty foot (60′) twin, "[t]o make scientific precision a criterion of constitutional power would be to subject the state to an intolerable supervision hostile to the basic principles of our government. . . ." *Sproles* v. *Binford,* 286 U.S. 374, 388 (1932).

This is not a case, as was *Raymond Motor Transportation, Inc.* v. *Rice,* where a legislature may be deemed to have acted in an apparent void of supporting evidence to prohibit longer trailers. Nor does it present a case where a State, as in *Raymond,* has acted in apparent self-interest to discriminate both explicitly and impliedly against foreign industries.[17]

What we have then is simply a court disagreeing with a legislature over the latter's choice made in the midst of competing safety considerations. Thus, the District Court in the appendix to its opinion notes with approval a statistician's disparagement of statistical evidence that supported the legislative choice. The legislative choice is thus held to a standard informed by hindsight. This, of course, is a far different matter from concluding that there was *no evidence* upon which the Iowa legislature could have made a rational choice.

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[17] "The Court is of the opinion that none of the pertinent regulations discriminate against interstate commerce. The Court is also of the opinion that CF did not establish unequal or improper enforcement of the law of regulations." 475 F. Supp. at 553.

The situation presented here is factually far removed from that presented in *Bibb* v. *Navajo Freight Lines, Inc. Bibb* presented a case where a State was attempting to innovate upon an established and generally accepted safety device. Here it is an industry that is attempting to bring a State's preexisting law into line with its own innovation. Moreover, in *Bibb* the contoured mud flaps which state regulation would have required were expressly found to possess "no advantages in terms of safety over the conventional mud flaps." 359 U.S. at 525. This Court did *not* say that the contoured mud flaps presented no advantages *overall.* Such a holding would have been contrary to the Court's long adhered to policy of not "second guessing" a legislative judgment, i.e., not "weighing in the judicial scales the merits or the demerits of the legislative choice and rejecting it if the weight of evidence presented in court appears to favor a different standard." *Barnwell,* 303 U.S. at 191. The instant case rather presents a situation in which a district court concluded, *on its scales of balance* (i.e., "overall"), that the legislative choice *should have been* in favor of the longer twins. No allowance in the District Court's weighing process is made for the Iowa legislature's right to view with a heightened concern, for example, the enhanced proclivities of twins to "jackknife or upset."

An examination of the District Court's own opinion demonstrates that Iowa advanced significant evidence to sustain the legitimacy of its own regulation as a safety measure. In *Raymond,* the majority noted that Wisconsin failed to make even a "colorable showing" that its fifty-five foot (55′) limit contributed to highway safety and Justice Blackmun's concurring opinion framed the issue in terms of the "illusory" nature of the State's safety justification. Whether the operative words are hereafter to be "colorable showing" or "illusory", it is obvious that tested under both articulations Iowa produced sufficient evidence.

That "significant evidence" upon which the legislature could have rationally made its determination should be the standard to be applied to a State's showing seems clear in view of *Raymond's* holding that the State cannot prevail where it virtually defaults in producing evidence. The Court has never held that the proponent of safety legislation must prove by a preponderance of evidence that "overall" it advances safety.[18] Indeed, the presumption has hitherto rested in favor of the validity of a safety measure. *Bibb,* 359 U.S. at 524 (1959).

The situation here vis-a-vis *Raymond,* is nearly the obverse of that presented in the Georgia blow-post cases, where the Court did not hesitate to change its view of a regulation based upon a later, more informing record. *See Southern Railway Co.* v. *King,* 217 U.S. 524 (1910) (state regulation requiring trains to slow at crossings upheld since railroad's pleadings did not even allege sufficient facts to support a burden on interstate commerce); *Seaboard Airline R. Co.* v. *Blackwell,* 244 U.S. 310 (1917) (same regulation held unlawful as a direct burden on interstate commerce upon allegation that six hours would be added to the run). *Raymond* would be consonant with a decision upholding the legislation in issue: "[W]e do not decide whether laws of other states. . .would be upheld if the evidence produced were not so overwhelmingly one-sided as in this case." 434 U.S. at 447 (footnote omitted).

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[18] *Cf., Ray* v. *Atlantic Richfield Co.,* 435 U.S. 151, 186-87, n. 8 (J. Marshall dissenting in part) stating: "A showing that there is conflicting evidence is not sufficient to undercut the presumption that a State's police power has been exercised in a rational manner." Justice Marshall cited *Brotherhood, supra,* with approval in his dissent.

IV

The Validity of A State Highway Safety Regulation Should Not Be Totally At The Mercy Of The Weight Of The Evidence Developed In A Post-Enactment Attack Upon Its Constitutionality.

It is respectfully submitted that it would be inappropriate for the courts to place emphasis upon the "weight of the evidence" developed at trial in litigation over the validity of state highway safety measures. In absence of apparent parochialism, the purpose of legislation is deemed to be the very reasons advanced by the legislature. *See Philadelphia* v. *New Jersey,* 437 U.S. at 624. Uniquely perhaps, in *Raymond* the claimed legislative purpose may be perceived as having been questionable since numerous locally-oriented exemptions to Wisconsin's fifty-five foot (55') rule cast grave doubt on the alleged safety purpose while at the same time strongly implying a prejudice in favor of local interests. Here, however, the District Court was specific in stating that "none of the pertinent regulations discriminate against interstate commerce." 475 F. Supp. at 553. If anything, the consistent application of these exemptions underscores the legitimacy of Iowa's safety concerns.

Although there is seemingly little excuse for a party's total default in meeting a burden of a "colorable showing", as was apparently the case in *Raymond,* at the other extreme, the validity of state safety regulations should not be utterly at the mercy of the often impressive litigation resources of their nationally well-organized opponents. Tushnet, *Reexamining the Dormant Commerce Clause,* 1979 Wis. L. Rev. 125, 161.

V

The Dispute Underlying This Case Will Continue To Be Worked Out By The Legislative Process.

There is reason to anticipate that the ongoing political process may bring Iowa in conformity with her surrounding

States. Court interference at this time would usurp the legislative function, *See Brotherhood,* 393 U.S. at 138; *Barnwell,* 303 U.S. at 191.

The case thus presents a dispute which will, given judicial restraint, "continue to be worked out in the legislature" *Brotherhood,* 393 U.S. at 144. The veto of Iowa's Governor alone now sustains the law in question.

CONCLUSION

For the reasons set forth in this brief, the Commonwealth of Virginia respectfully requests that this Court reverse the decision of the Circuit Court and refrain from enjoining enforcement of Iowa Code § 321.457. This statute, challenged under the dormant Commerce Clause, is a legitimate state highway safety regulation, is presumed to be valid and is supported by significant evidence upon which the legislature could have rationally made its choice.

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of July, 1980, three copies of the foregoing Amicus brief were mailed, first class postage prepaid, to the Honorable Mark E. Schantz, Solicitor General of Iowa, Hoover State Office Building, Des Moines, Iowa 50312, counsel for Appellants, Raymond Kassel, et al and to John H. Lederer, Esquire, 121 South Pinckney Street, Madison, Wisconsin 53703, and to Terry C. Hancock, Esquire, 110 Des Moines Building, Des Moines, Iowa 50309, Counsel for Appellees.

WALTER A. MCFARLANE

APPENDIX

Article I, Section 8, Clause 1 of the United States Constitution

> "Section 8. The Congress shall have power to. . .provide for the common defense and general welfare of the United States. . . ."

Article I, Section 8, Clause 3 of the United States Constitution

> "Section 8. The Congress shall have power. . .To regulate commerce. . .among the several states. . . ."

Section 101(b) of Title 23 of the United States Code

> (b) It is hereby declared to be in the national interest to accelerate the construction of the Federal-aid highway systems, including the National System of Interstate and Defense Highways, since many of such highways, or portions thereof, are in fact inadequate to meet the needs of local and interstate commerce, for the national and civil defense.
>
> It is hereby declared that the prompt and early completion of the National System or Interstate and Defense Highways, so named because of its primary importance to the national defense and hereafter referred to as the "Interstate System", is essential to the national interest and is one of the most important objectives of this Act. It is the intent of Congress that the Interstate System be completed as nearly as practicable over the period of availability of the thirty-four years' appropriations authorized for the purpose of expediting its construction, reconstruction, or improvement, inclusive of necessary tunnels and bridges, through the fiscal year ending September 30, 1990, under section 108(b) of the Federal-Aid Highway Act of 1956 (70 Stat. 374), and that the entire System in all States be brought to simultaneous completion. Insofar as possible in consonance with this objective, existing highways located on an interstate route shall be used to the extent that such use is practicable,

suitable, and feasible, it being the intent that local needs, to the extent practicable, suitable, and feasible, shall be given equal consideration with the needs of interstate commerce.

It is further declared that since the Interstate System is now in the final phase of completion it shall be the national policy that increased emphasis be placed on the construction and reconstruction of the other Federal-aid systems in accordance with the first paragraph of this subsection, in order to bring all of the Federal-aid systems up to standards and to increase the safety of these systems to the maximum extent.

Section 145 of Title 23 of the United States Code

§ 145. Federal-State relationship

The authorization of the appropriation of Federal funds or their availability for expenditure under this chapter shall in no way infringe on the sovereign rights of the States to determine which projects shall be federally financed. The provisions of this chapter provide for a federally assisted State program.

Section 321.457 of the Iowa Code (1979)

321.457 *Maximum length.* The maximum length of any motor vehicle or combination of vehicles, except fire fighting apparatus and vehicles operated in the daytime when transporting poles, pipe, machinery or other objects of a structural nature which cannot be dismembered readily when required for emergency repair of public service facilities or properties, and such vehicles transporting such objects operated at nighttime by a public utility when required for emergency repair of public service facilities or properties but in respect to such night transportation every such vehicle and the load thereon shall be equipped with a sufficient number of clearance lamps on both sides and marker lamps upon the extreme ends of any projecting load to mark clearly the dimensions of such load, at which time, a member of the state highway patrol shall be notified prior to the operation of such vehicle, shall be as follows:

1. No single truck, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

2. No single bus, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of forty feet.

3. Except as to combinations of vehicles, provisions for which are otherwise made in this chapter, no combination of truck tractor and a semitrailer hauling livestock shall have an overall length, inclusive of front and rear bumpers, in excess of sixty feet, nor shall any other combination of vehicles coupled together, unladen or with load, have an overall length, inclusive of front and rear bumpers in excess of fifty-five feet. Combinations of vehicles consisting of a motor vehicle upon which a van box is fastened and which draws and bears a portion of the weight of a semitrailer purchased by an Iowa resident prior to April 16, 1974, may be operated on the highways of this state with a length exceeding fifty-five feet but not exceeding sixty feet, if a special overlength permit is obtained from the department for such operation. This special overlength permit shall be issued for the vehicle and such permit shall be valid until such time as the vehicle is no longer operable or until the owner of the vehicle transfers title to the vehicle to a nonresident. All such vehicles purchased after April 16, 1974, shall not be allowed to operate on the highways of this state.

4. However, a mobile home not in excess of forty-eight feet in length may be drawn by any motor vehicle, except a motor truck, provided, however, that the mobile home and

its towing unit shall not be in excess of an overall length of sixty feet. For the purposes of this subsection, a light delivery truck, panel delivery truck or 'pickup' shall not be construed to be a motor truck. Further providing that a portable livestock loading chute not in excess of a length of thirteen feet including its hitch or tongue may be drawn by any vehicle or combination of vehicles, provided that such vehicle or combination of vehicles drawing such loading chute is not in excess of the legal length provided for such vehicles or combinations.

5. No combination of vehicles coupled together which are used exclusively for the transportation of passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, travel trailers, boats, farm and industrial tractors and self-propelled farm implements, nonself-propelled implements of husbandry, and self-propelled vehicles shall have an unladen length, inclusive of front and rear bumpers in excess of sixty feet, but the passenger vehicles, light delivery trucks, panel delivery trucks, pickup trucks, or boats being transported may extend up to three feet beyond the front and rear bumpers of the transporting vehicles when the overall length of the vehicle with load does not exceed sixty-five feet.

6. No combination of three vehicles coupled together one of which is a motor vehicle, unladen or with load, shall have an overall length, inclusive of front and rear bumpers in excess of sixty feet.

7. A motor vehicle or combination of vehicles may be operated upon the highways of this state, irrespective of the length and weight limitations imposed by the laws of this state, if the motor vehicle or combination of vehicles is operated within the corporate limits of a city abutting a border of this state and such operations have been approved by ordinance of the city council and if the length and weight of the motor vehicle or combination of vehicles

is in conformity with the laws relating to length and weight of the abutting state on July 1, 1974. If a city council has authorized such operation upon highways within the corporate limits, then the limit of travel for such motor vehicles or combination of vehicles within the state is extended to the commercial zones as described by federal regulations concerning interstate commerce, 49 code of federal regulations, paragraphs 1048.10, 1048.38, and 1048.101 as they exist on July 1, 1974.

Section 46.1-330, Code of Virginia (1950), as amended

§ **46.1-330. Length of vehicles; generally; special permits; buses with safety bumpers.**—No motor vehicle exceeding a length of forty feet shall be operated upon a highway of this State. The actual length of any combination of vehicles coupled together including any load thereon shall not exceed a total of fifty-five feet; and no tolerance shall be allowed that exceeds twelve inches. Provided, however, that the State Highway and Transportation Commission when good cause is shown, may issue a special permit for combinations in excess of fifty-five feet including any load thereon where the object or objects to be carried cannot be moved otherwise; and passenger buses in excess of thirty-five feet, but not exceeding forty feet, may be operated on the streets of incorporated cities and towns when authorized pursuant to § 46.1-180; and provided further, that vehicles designed and used exclusively for the transportation of motor vehicles may have an additional load overhang not to exceed five feet; and provided further, that in an emergency as defined in § 46.1-339.1 the towing of disabled vehicles which cannot be separated for safety, physical or mechanical reasons and which exceed fifty-five feet in length shall be permissible for the purpose of towing any such vehicle to the nearest facility which can make the necessary repairs but not more than fifty miles from the point such vehicle was disabled; and provided further, that passenger buses may exceed the forty-foot limitation when such excess length is caused by the projection of a front safety bumper or a rear safety bumper or both. Such safety bumper shall not cause the length of the bus to exceed the maximum legal limit by more than one foot in the front and one foot in the rear. "Safety bumper" means any device which may be fitted on an existing bumper or which replaces the bumper and is so constructed, treated or manufactured so it absorbs energy upon impact.

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